Information Design

Tools and Techniques for Park-Produced Publications

National Park
FOUNDATION

INFORMATION DESIGN

Tools and Techniques for Park-Produced Publications

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Foreword

The National Park Service is fortunate indeed to have a strong corporate identity. The Unigrid format is applied to virtually all Park Service publications and serves to visually bind our diverse organization together. Visitors to parks throughout the system know that they are in a national park when they see the characteristic black band at the top of their publication.

Indeed, the black band has developed such a strong identity that even non-NPS entities are using it to give their publications "that certain something." The Unigrid-based site bulletin format affords a framework that park publishers can use and, with a little practice, produce admirable results.

Not every design problem, however, has a Unigrid solution. With the advent of desktop technology, park-based publishers are capable of exploring new ways to communicate with the printed word. Folders, booklets, trail guides, posters, yes, even "Park Closed" signs are being designed and produced in-park.

This expanded capability, like any new freedom, brings with it expanded responsibility. We must know how to use type properly, how to design a page so that the information speaks clearly to our visitors. Tasks that once were left up to contracted designers and printers are now often the job of park-based publishers. They should know how to speak the language of a printer, they should know how to write printing specifications that leave nothing to chance, they should understand copyright laws, and they should know how to design a map to minimize the chance of folks getting lost.

This handbook addresses those new capabilities, freedoms, and responsibilities. We are always concerned about the quality of our personal presentations to the public; it is important that we also take care with how we present ourselves on the written page. Everyone in every division of a park, be it protection, cultural resources, maintenance, administration, or interpretation, anyone who creates printed pieces for public consumption, should keep quality in mind and study this book.

A quality product, in any medium, speaks to our professionalism and our pride in the work we do. Our measure of success is having our messages move from the written page into the minds and hearts of our visitors.

Corky Mayo
Chief of Interpretation
National Park Service

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Introduction

Over the past few years, the proliferation of desktop publishing technology has allowed many park and cooperating association personnel to take on publishing tasks that traditionally had been the domain of contracted designers and printing houses.

Many projects that go beyond the scope of site bulletins are being produced by these personnel. Park newspapers, planning documents, programs, newsletters, trail guides, posters, booklets, and educational curricula are among the many types of publications now being designed in-house. Employees with little experience are being asked to write printing specifications and to make informed decisions while dealing with printing houses. Park-produced materials are highly visible to our visitors and are therefore a powerful voice speaking to our professionalism.

In December 1995 a week-long workshop was held at the Cuyahoga Valley Environmental Education Center, near Cleveland, Ohio, for 50 National Park Service and cooperating association personnel. The participants, from parks and associations throughout the National Park System, came with varying levels of expertise. Some had recently accepted publications duties while others had been working on publications for many years. All brought with them an interest and, in many cases, a passion for publications.

The goals of the workshop were:

- To improve the quality of self-published materials produced at the park level by park and cooperating association staffs.
- To improve communications among NPS and cooperating association personnel who produce publications for the parks.
- A third goal, accomplished with the publishing of this book, is to provide a handbook, a ready reference, for park and cooperating association personnel based on the information presented during the workshop.

The instructors at the Cuyahoga workshop, representatives of the best in the public and private sectors, were selected not only for expertise in their fields but for their ability to pass along their knowledge. They were excellent teachers. It is hoped that this book will allow you to gain not only the valuable information that was presented but also a sense of the importance of design excellence in park-produced publications.

The workshop subjects ranged from creativity and publications planning to how to work with printers and copyright guidelines. The focus of the workshop was design. Robin Williams, an author-speaker-trainer based in Santa Fe, conducted a day-long session based on her book, *The Non-Designer's Design Book*. A copy of that book is included in this handbook package.

This handbook is organized in the same order as the workshop sessions. Information about the World Wide Web and other electronic media is not included in the handbook for two reasons:

- Copies of the NPS Web Publications Guidelines and other materials are readily available for downloading from the NPS Web Helpdesk at www.nps.gov/helpdesk.
- The technology in this area is changing so rapidly that it is best to keep up through on-line browsing and through reading the current periodicals.

Most of one day of the workshop was spent visiting a large printing operation and a quick-print shop near Cuyahoga Valley National Recreation Area. You are encouraged to visit similar businesses in your area to become acquainted with terminology used by printers and to learn about their capabilities.

Read the handbook from beginning to end or read whatever strikes your interest. Pertinent handouts are included; you are encouraged to add and share new materials as you come across them.

Tom Davies, Course Coordinator
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INFORMATION DESIGN

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The Creative Process

Christina Watkins

Christina Watkins is a graphic designer and publications consultant. She has designed many award-winning books and other publications for cooperating associations. She lives in Flagstaff, Arizona.

Do you consider yourself creative? Many people are convinced that creativity is the exclusive property of artists, writers, and musicians. I disagree. I believe we all come into this world with an equal number of talents, and that certain ones develop as a child is shaped by his or her environment.

For instance, I showed some artistic abilities at an early age that were nurtured by my parents, who were themselves very creative. But I'm sure that I also have within me some more linear aptitudes which are yet to develop—such as checkbook balancing skills, tax comprehension, and general frugality, all of which my husband is encouraging.

We have a certain awe and respect for people who are creative. We revere great art, study it, and devote museums to it. Nonetheless, remember that creativity *does exist* in each and every one of us.

Do you realize that you make creative decisions every day? You decide what clothes to wear; what house to buy; which fabric for the sofa; what kind of car to drive; what foods complement each other for a meal; what music to listen to.

Music is fascinating in its variety and complexity, and yet all music is a form of logic (some more noticeable than others) based on a finite number of mathematical combinations. Design is also logic, and that is the form of creativity with which we are concerned in this Information Design course.

Design is defined as the organization of parts into a coherent whole. We somewhat arrogantly consider this to be a human expression, but design is in reality the underlying process by which the universe was formed through orderly procedures of selection and evolution.

Not everyone aspires to be a professional designer, but *everyone* is affected by design. Architecture—the schools, houses, buildings in which we spend our lives. Product design. Urban design. Traffic design. No one can deny being awed and delighted by the

infinite variety of designs in nature—snowflakes, flowers, patterns in rocks, clouds. Also affecting us are the designs of natural systems such as food webs, weather patterns, seasons, the very sophisticated design of our own bodies.

Allow yourself to be inspired by everything around you. Relax. Open your mind and eyes to draw inspiration from *life*. Design shouldn't begin and end at your desk—it is inextricably a part of you.

Six Problem-Solving Steps

Now let's examine the *process* of creating relative to our special need to design information. Design is problem solving, which can be divided into six steps:

1. *Define the problem*. Ask these questions: What is the essence of the subject or information? Who is the audience? How will they receive the information? How will they use it? All of the answers to these questions will affect the form and design of your solution.
2. *Stare out of the window.* Justify *this* to your boss! Mull over the problem. In my work, weeks sometimes pass before I ever put pencil to paper—this is very *valuable* time. This is where it all begins, as an idea in your head, before you pick up a pencil, before you touch a keyboard. This part of the process can be going on while you are doing other things; once you have begun the process, it will go on subliminally, until it is re-solved.
3. *Sketch your idea.* The painter Piet Mondrian was said to place squares and rectangles of colored paper on the walls of his apartment in order to live with them, subtly changing the arrangement, until the *idea* for a painting took shape. This may be a bit of an extreme example, but it is not unlike sketching out your thoughts—doodling—until it all begins to make sense. There are certainly parallels in all of the arts: Writers make outlines; musicians sketch the overall structure of a composition; architects—well, you wouldn't just start building a house without a plan of some kind, would you? Graphic design is much the same.
4. ***Important note*:** You must nurture the idea stage and not let it develop too quickly; allow it to grow. A pencil is a good tool for feeling the impermanence of an idea as it develops.

5. *Bring the design idea, materials, budget, and time together and simmer.* Take the time to step back and look at your concept and be open to changes in your original idea.
6. *Create a layout for review.* More than likely you will need to show your design idea to someone for approval before proceeding, but you also should do this for yourself to make sure that the concept is workable. Use whatever means you have to simulate the finished piece as realistically as possible. This is an important step, because by holding the actual-size piece in your hands, you might discover that a certain way of folding doesn't work or is confusing, a choice of paper or color is inappropriate for the site, or the flow of the piece is unclear.

Liberating and Terrifying

Now that you are about to become designers for some very important pieces of information, I have some news for you. The bad news is that it is *hard* making the *right* choices and trusting in your judgment. The good news is there is no right or wrong decision, there is good and bad—a matter of function and taste—but there are lots of right choices.

The infinite potential solutions to a given problem can be liberating and terrifying at the same time. You will find, though, that your style will emerge from your choices, *as individual as a fingerprint*.

Developing a Park Publications Plan

Bruce Hopkins

Bruce Hopkins is a freelance writer-editor and publications consultant. He formerly was an editor in the National Park Service's Division of Publications and a newspaper editor.

The focus of this workbook is publications design, but before you start showing your creativity in that area, I want you to think about doing some down-to-earth planning. Every National Park System site and every cooperating association should have a Park Publications Plan—preferably a joint plan.

Let's say you work in the park's interpretation division and are the park coordinator of publications or that you work on new free and sales literature for a cooperating association and act as the association's publications coordinator with the park staff.

You are faced with what Bill Everhart, a former assistant NPS director, used to call the "bottomless pit of publications." Every Tom, Dick, and Jane on the park staff wants a publication about whatever they are doing. Whatever they are doing is extremely important and the park must get the word out about their particular program.

The superintendent's cousin has written a 10,000-word discourse on butterflies, has taken more than 400 marvelous photographs of butterflies, and has collected 200 black-and-white line art sketches of butterflies by the superintendent's cousin on the other side of the family. The superintendent thinks this historic site could use a good book about regional butterflies.

Besides dealing with that proposal, you have been asked to create a site bulletin for a special park event that is coming up the day after tomorrow. You already are working on four new site bulletins, revising another, and reading the proof of 200-page guidebook about the park that needs to be returned to the printer next Monday.

You are up to your eyeballs in projects when the chief of interpretation walks into your office and says: "Let's see now, we lost five permanent interpreters and are losing ten seasonals this

summer, so let's create a series of brochures and self-guiding trail leaflets to fill gaps in personnel."

You thought you were strung out before. Now you have to produce even more publications. Will the demands ever stop? As Ed Zahniser used to say at Harpers Ferry Center when massive folder revisions rolled in every year from the same park, "Well, at least it's job security."

In these times of reduced staffing and reduced budgets, the need for publications and other informational and interpretive media—especially publications—is becoming greater.

A Park Publications Plan will not resolve all problems, but it can reduce the number of conflicts and can reduce stress, both personal and budgetary.

Benefits of Having a Plan

A Park Publications Plan:

- Brings all publications ideas and suggestions together so they can be analyzed and compared at the same time.
- Helps organize your work so you are not pulled in all sorts of directions.
- Helps both the park and association know what each other is doing so they do not duplicate efforts.
- Sets priorities so you can budget your time and money.
- Provides continuity as park and association staffs change.

Too many people who are not familiar with the publications process think that they can be done quickly. They might not write anything longer than a one-page memo. They may have never designed a brochure or even thought about design, but a little two-fold brochure looks so simple they think it can be done in an afternoon. A brochure, after all, is just words and pictures. What's the big fuss?

By setting priorities in a Park Publications Plan, the interpreter and the association representative have something with which they can fend off new requests.

A plan allows them to say: "Okay, Mr. Chief of Interpretation and Ms. Superintendent, you say today you want a 24-page guidebook for the River Heritage Trail. How does this fit in with the new 64-page interpretive booklet on women's history, with the 32-page booklet on park birds, and the four site bulletins on park themes? Which ones do you want to set aside to do this new guidebook on the River Heritage Trail?"

"Is this proposed guidebook to be in full color? How many do you want to print? Has a text been written? Have illustrations and photographs been collected?"

"Let's do a cost estimate and then you and I and the association's board of directors can decide if we want to set aside our other priorities and take on this new project".

A Park Publications Plan does not mean that you cannot drop present projects and take on something else, but it does give you—the association and the park interpretation staff—a base on which to make such judgments.

Someone may walk in the door tomorrow with a wonderful manuscript about the carriage roads of Acadia National Park, about the coal mining days in New River Gorge, about the variety of wildlife living in Mammoth Cave, about the non-Sequoia trees in Sequoia National Park. The person might be full of enthusiasm and offer the text and a collection of illustrations to you for nothing. All the writer wants is a credit line.

If the material looks good, you might want to change priorities and insert it into your plan while everyone is interested and excited about the project.

If it looks good but you have neither the time nor the money to take on the project, you can suggest that the writer try to get the book published commercially and wholesale it to the association.

If the material looks dreadful, however, you can refer to your Park Publications Plan and tell them you already have 10 publications planned for the next few years.

What Should be in a Publications Plan?

A Park Publications Plan should contain both background information, current projects, and future possibilities. It should include:

- A list of all publications sold at the park. Some park associations call this a Scope of Sales Statement and use it to brag about the many interpretive items they sell, and some associations use it defensively when dealing with commercial vendors who are trying to talk them into selling their new products.
- A list of all free publications currently produced by the park staff, by the association, and jointly.
- A list of free publications produced by other organizations that the park or association gives to visitors.
- A list of all publications projects proposed by the park staff and the association.

- A list of 10 or 12 publications priorities with deadlines and budgets set for each of them.

To make the plan even more complete and useful to new staff members, the plan also could include:

- A statement on the origin, mission, and significance of the park.
- A list of the park's major and secondary themes or subjects.
- A brief description of the park's informational services, cooperating association sales outlets and facilities, and an overview of the history of sales at the park.

This information is contained often in Scope of Sales Statements or other documents, so it is relatively easy to include it in your Park Publications Plan.

How to Create a Publications Plan

There is a tendency these days to have everything done by committee and to have everybody on the committee. I strongly recommend that you not do that when forming a Park Publications Plan.

Get together a small group of perhaps three to five park and association staff members who customarily work on publications. In some parks, the interpreters might take the initiative in this effort. In others, the association might take the lead. If the association has a publications committee, it should be involved in the process in some way.

Let us assume that the small group consists of four people—two park interpreters and the executive director and the publications specialist or other employee of the association. This small group starts the process of making a Park Publications Plan by pulling together the background information and the various lists I mentioned earlier.

The group, or individuals in the group, should talk with other park and association staff members to get publication proposals from resource specialists, law enforcement rangers, historians, archeologists, and others besides interpreters. Make them a part of the process—but not a part of the whole process.

A handy tool to determine gaps in your interpretive sales publications is Russ Smith's Scope of Sales Matrix, which appeared in the Fall 1995 issue of *The Exchange*, the quarterly publication of the Conference of National Park Cooperating Associations (see appendix).

His hypothetical matrix for Independence National Historical Park lists the titles of publications in the left column. Across the top it lists topic areas such as orientation, site specific items, biographies, Revolutionary War, political revolution, capital city, and special focus.

Then it lists different audiences: adults, kids to 3rd grade, kids 4th grade on, the visually impaired, and foreign language.

Then it lists interest area: beginner, average, and scholarly.

It ends with three price groupings: up to $4.99, $5 to $9.99, and more than $10.

By checking off the boxes, you quickly see holes or gaps in the sales publications you offer.

Make up your own matrix for sales publications. Adapt Smith's categories to fit your park. Are there any gaps in your program? Are all audiences served? Do the items on your list of proposed publications fill any of the gaps?

Many parks and associations have found that they have few publications or none for children, especially adolescents. Some parks have little or nothing for non-English-speaking visitors even though they have many tourists from abroad.

Keep in mind, as you study what you already have done and what you want to do, that there is no sense in producing a new publication if there already is an excellent or suitable one on that subject produced commercially. Sometimes an excellent book is going out of print, and the association can purchase the remaining stock at greatly reduced rates. It might be a wiser investment for an association to purchase a five-year supply of such a book than to spend a lot of money on a new book that will take three or more years to complete.

When making such decision, remember these words of advice in Acadia's Scope of Sales Statement for Eastern National Park and Monument Association: "... care must be taken to ensure historical or scientific accuracy of the content, as well as a professional style of writing, illustrating and production. Just because an item is theme-related does not automatically justify its appropriateness for sale."

Besides creating a matrix on sales publications, you could make a similar matrix for the free folders you produce. The matrix might show that you are putting too much emphasis on secondary themes and not enough on the park's primary themes. Or it might

show that you are neglecting a major portion of your audience.

Once you have listed all the publications you sell and those you give away, you can go to work on what really fascinates publications fanatics: proposals for new projects.

Brainstorm. Get your small group together and have a free-wheeling session in which each of you rattles off ideas. Make a list as you go and do not get sidetracked into discussing them in depth. You first want to put together a list of all ideas.

Then, go through the list and group similar items: new free site bulletins and folders; new booklets; extensive revisions of present titles and resurrections of out-of-print titles; large book projects; postcards; and other theme-related merchandise. You may have other categories you want to include.

By breaking down your list into categories, you gain a sense of what are minor projects that should take a short time and a small outlay of funds to complete, what are expensive two- or three-year projects, and which ones fall somewhere in between.

As you list proposals, think of their marketability—a dirty word to park interpreters but an important factor in these days of reduced budgets and heavy workloads. Marketability applies primarily to the sales items, of course, but it applies to free items, too. Is there really enough of an audience for a free folder on an esoteric subject? Is it worth the time and energy?

Then list your top 10 priorities; they might include several free folders, a couple of medium size booklets, and one or two large and relatively expensive projects.

The priorities become the focus of your Park Publications Plan. I recommend that you think of it as a two-year plan but with the thought that you will update it after one year. Do not toss out the good proposals that did not make the list; that information will help you form your next plan.

Present the plan to the superintendent and to the association's board of directors for their approval.

Then comes the hard part: linking your priorities with the budget. The superintendent and the chief of interpretation may have some funds to devote to publications; more than likely most of the funds will come from the association, so the association board of directors will have to decide—with recommendations from the executive director—on how much to budget for each project, or group of projects. The board might allocate a block of funds for a

series of small folders or booklets instead of determining the budget for each.

In the past some associations have pledged publications funds based on expected sales. In these days of downsizing and closings, associations are feeling the pinch, too. They may well want to have the money on hand *before* agreeing to fund a project.

In determining how they can budget for new publications, associations—and park interpreters—have to be mindful of setting aside funds to reprint locally-produced materials. Sometimes associations and park staffs produce nice publications, but they go out of print because no one has budgeted for reprints in subsequent years.

Implementing a Publications Plan

Once funds have been allocated, you can start the real work—creating the actual publications.

Most of the projects are likely to be joint efforts by the park interpreters and the association publications specialists. Make clear at the outset who is doing what and when. Determine who is going to be in charge of each project and who is going to do the bulk of the creative work.

Who will write the text? Who will edit the text? Who will review the text? Who will gather, produce, or make sure others produce the illustrations and photographs? Who will design the publication? What will the designer's responsibilities be? Who will oversee the project through the production phases?

These and many other questions have to be answered, and some of them are considered in other parts of this workbook.

There are many tasks in creating a publication, and by determining priorities, the Park Publications Plan allows you to concentrate on these tasks for specific projects. All of a sudden you have real projects and possible future projects instead of a bottomless pit of ideas for publications.

Even with only 10 priorities, you may have to handle several publications projects. But try to focus on one at a time. A focused mind gets a lot more done faster and more effectively than an unfocused mind. You will be surprised how much you can accomplish when you concentrate on one project rather trying to work on several at the same time.

Of course, a project can go on and on if you allow it, too. There is a tremendous inclination to let a project drag on. We have

all heard the reasons: “I’m waiting for one more research report.” “I have to read three more books on the subject.” “I’m waiting for some data from the archeological team that dug in the park 15 years ago.”

Remember, publications, unlike most other interpretive media, can be revised relatively easily and inexpensively—unless the project is a large coffee table book or an extensive scholarly treatise. More than likely, you will be working on a small brochure or booklet. You or your writer probably know more about the subject than can possibly fit in the publication, so go to work and get it done.

Then, tackle the No. 2 project on your list, then No. 3, etc. Before you know it, you will be looking at the items in the Park Publications Plan that have not been prioritized and pondering future projects.

Taking a Look at One Plan

Park Publications Plans will vary from park to park depending on the size of the park, the association budget, the interests of staff members, the interpretive and informational needs, and other factors.

Read the plan for Cape Cod National Seashore in the appendix to see how one park and association arrived at a plan. An interpretive planner at Harpers Ferry Center helped the park staff and the local staff of Eastern National develop the plan as a part of an Interpretive Prospectus within an overall Master Plan for the park. Most parks and associations probably will produce a publications plan separate from those documents, but some of them might want to use a facilitator who does not work at the park to lead discussions and give advice.

The interpretive planner held two day-long brainstorming sessions with the chief of interpretation, the park historian, association staffers, a publications specialist from Harpers Ferry Center, and two members of the Master Plan team. Other park staffers joined the discussions at various times to contribute their ideas for both free and sales publications.

The interpretive planner took extensive notes as the group discussed proposals and then prioritized them. The discussions allowed group members to voice their interests, their concerns, and their objections and often new ideas surfaced or proposals were revised or dropped from further consideration.

The next steps will be to budget funds for the prioritized projects, start and complete the publications, and update the plan every year or two.

A Park Publications Plan should help you, not hinder you. Just because you have formed a plan, do not become inflexible and ignore new ideas. If a manuscript comes in the door or over the transom, give it a fair appraisal. If it makes sense to revise your priorities, run the idea by your committee, by your chief of interpretation, by the executive director and the superintendent. The proposal at least can go on the long-range list if you cannot insert it in your current priorities.

Revise and update your Park Publications Plan every year. You not only will keep your plan current, but you will see if you are spending your time and funds wisely.

Some Biased Advice

Now, I'd like to end by going off on a brief tangent.

This workbook is primarily about publications design. It also deals with printing and other subjects, such as cartography and copyrights.

Writing and editing are not a part of this workbook, but I want you to know that I—a writer-editor—think they are important parts of the publications process. This workbook would be twice as long if they were included. There are plenty of good books about writing and editing for you to read (see bibliography).

For now, just remember that there is no sense in designing and printing a publication that is poorly written. The best design in the world cannot save a terrible text. A good design can help a bad text, but a deadly dull or poorly written text should not be published. The text must make good sense. A publication should bring credit to the National Park Service or your association or both of them in what it says and in how it looks.

Make sure your texts are reviewed and edited for accuracy, thoroughness, and clarity. Have they been written in an interesting manner? Do they provide essential information? Will they spark curiosity in the park visitor's mind?

A writer hates to let go of his or her text. But a professional writer realizes all too well that it is much better to get critical reviews before texts are published than afterwards. Save your writers—and yourself—embarrassment by eliminating as many errors as possible before you have the publications printed or before you run off copies on your computer or copier.

If a project becomes caught up in local politics either in the park or the association, get an outside reviewer or editor to take a look at the text. Such a review could save you lots of time, money—and grief.

Desktop publishing has turned many people into publications producers. I am not convinced it has turned them into writers or editors. Know your strengths and weaknesses. Seek and accept help and advice.

There already is too much for us to read but little that we must read.

NPS Design Ethics

Melissa Cronyn

Melissa Cronyn is Chief of the National Park Service's Division of Publications at Harpers Ferry Center. She formerly served as the division's Chief of the Branch of Graphics.

Before we begin I'd like to thank you for inviting me to participate in this workshop; it's a pleasure to be here and see so many familiar faces from the site bulletin courses I taught in the past.

In their welcoming remarks, Glenn Clark mentioned the growing importance of creative partnerships in the Park Service and Russ Smith talked about this course being a first step in the process of information-sharing as a means to help park staffs solve problems encountered in the preparation of publications. I'd like to emphasize, on behalf of those of us at Harpers Ferry Center, our rededication to those two concepts and the larger role we hope to play in an outreach mode, helping parks solve various media problems.

In terms of this course being a beginning, I hope one of the things that will come out of this workshop is an NPS electronic clearinghouse, which would serve as a repository of references, resources, guidelines, professional assistance, and a place for park people to share experiences in the field of publishing.

A few years ago I attended a conference in Chicago sponsored by the American Institute of Graphic Arts, one of the oldest and most prestigious design organizations. The overriding concern expressed by both seasoned professionals and brand-new designers was the crisis of conscience they were experiencing doing work for commercial clients whose products or work ethics were questionable. These graphic designers were experiencing serious moral dilemmas, and it really hit home to me how terribly lucky we are not to have that kind of problem about the work we do.

In the publishing world of graphic design, Park Service publications are clearly different in a number of important ways. First and foremost, the resource is paramount and the fundamental integrity of the park is a given.

As I've listened to you describe the types of projects being worked on, it's clear that we're all in the communications business,

conveying information and ideas about the resources to people who are part-owners. And despite all the talk about "customers," the parks are not shops, they are national property visited by property owners for whom it's important to reaffirm that proprietary concept.

There's a certain inherent value in parks that is part of who we are as a nation and which elevates any media connected with them beyond anything comparable in the commercial world. As such, design decisions about that media become doubly important.

This does not mean publications can't be fun, imaginative, and spectacular in their presentation. It does mean they should be responsible in their design and reflect the same inherent integrity and credibility invested in the parks by the public.

What does this mean in practical terms? It means when you are the designer you have enormous power to enlighten, delight, inform, and amaze your reader depending on the choices you make of typeface, typesize, placement on the page, combination with other elements such as artwork, photos, or maps, and the choices of color, paper, ink, and a whole host of other options.

At the same time, you have the potential to confuse, irritate, frustrate, or anesthetize your reader depending on those same choices.

Worst of all you can inadvertently send visual signals that contradict or invalidate the very message you are trying so carefully to communicate.

This is a *thinking* person's design. As Christina Watkins said about the necessity of defining the problem, design in this context does not exist in isolation: it emanates from editorial emphasis and as such must be carefully orchestrated. The concept of *orchestrated design* is not accidental; the musical metaphor Christina mentioned is very apt for describing successful design. How you arrange type, art, and white space on the page (common wisdom suggests that a good layout will have one third of each) reflects a rhythm, underlying themes, occasional moments of powerful emphasis (as in a strong image or bold type), or quiet passages (as in white space) that helps create a dynamic yet unified whole.

In a successful layout, primary and secondary editorial themes will be clearly conveyed to the reader in the visual clues contained in the particular type styles and sizes chosen by the designer, in their placement on the page, and in the nature of any attending

graphic elements or images used to further the message. Content defines the design.

Robin Williams will talk in detail about principles of design, typography, and staying in control when you combine elements in your layout. Beyond those individual decisions, however, are larger issues. When you are designer, writer, editor, or cartographer, keep in mind that your reading public invests what you produce with trust and authority. That's one of the perks of working for the Park Service. Therefore, your publications should, as obvious as this sounds, *look like you know what you're doing!* That is as true for NPS Unigrid publications as it is for park-produced folders.

What qualities should a publication or other park-produced media have?

- It should be convincingly organized. Don't make your reader hunt for the message. There should be a clear hierarchy of information and an obvious order to what should be read first, second, and so on. In the quest for creative fulfillment, it's tempting to indulge in individual whims, but it's equally important to not lose sight of the needs of your reader. Keep in mind also that there's a fine line between inspired whim and chaos. When in doubt, keep it simple.
- Make sure your design choices reflect the editorial intent of your publication. Whatever the purpose, there should be continuity and correlation between text, map, and any graphic elements. Make sure the graphic elements further the reader's understanding of your point. You shouldn't include photos, for example, that are at odds with, or inappropriate for, the accompanying text.
- Megan Kealy will talk more about this, but if you have a map, important place names that appear in the text should also appear in the map, spelled the same as they are in your park signage. And remember, the best map in the world won't help in your folder if it's not supported by clear, accurate signs on the ground.

As you consider the many choices before you, keep in mind the difference between an artist and a designer: art is the personal, creative expression of *individual* need; design is the creative expression and satisfaction of a *common* need. You are all communicators and this kind of design is about communicating ideas and information using words and images; it's about creative problem-solving to meet a common need.

There's one other point I'd like to make: we're entering into a period of great possibility with the reengineering of the National Park Service but at the same time, with decentralization, there's a greater chance of loss of the image of the Park Service as a cohesive unit. In a sense, it's a loss of corporate identity. I believe it's more important now than ever that the products you and I put before the public should convey some sense of the organization as a whole and the viability of that organization.

One of the great ironies of this high-tech age is that more and more people sense something missing in their lives and come to the parks to reconnect: with nature, with their heritage, and with themselves. The Park Service has a very high public visibility, and, as was demonstrated during the furlough, strong public support. People invest the parks with integrity and the products we produce should reflect that integrity. Many businesses, including small businesses in the towns surrounding the parks, have desktop publishing systems now, so it's important that we not produce flyers, newsletters, etc., that look like they came from the local hardware store or beauty salon.

What can you do to produce imaginative publications that reflect Park Service values?

- Be *very choosy* about the typeface you select. Some of those faces available on computer were designed as display fonts and never intended to be used as reading text. Stick to a few clean, clear, readable faces. Don't try to convey an Old West feeling by using letters that look like they were constructed from barbed-wire fencing!
- Be choosy about the graphic elements you select. Fussy borders, decorative motifs, cutesy cartoons don't belong in these folders, unless it's strictly for in-house use. They'll clutter your publication, dilute your message, and diminish your credibility. Lack of clutter speaks volumes.
- Select images carefully. Don't use dark, busy, indistinct, or soft-focus photos; they'll only get worse when your folder is Xeroxed or printed.
- Before you do anything, prepare an outline that clearly defines your hierarchy of information. Let the design decisions come from your editorial emphasis. Visual elements you choose should further your message, not be at odds with it. Don't try to cram too many images in one publication just because you have access to great photos.

- Be consistent in the visual signals you send. Whatever point size or style of typeface you choose, such as italic, bold, light, for your reading text, captions, feature copy, labels, credit lines, headlines, etc., stick to those choices throughout the publication. Do the same with the spacing from, say, headline to text. Set up a style sheet to work from so you maintain continuity from beginning to end. Main theme headlines should have more impact than subtheme headlines, but keep in mind that too many screaming headlines on a small sheet creates visual overload. To return to the musical metaphor: too much emphasis just becomes noise.
- Bruce Hopkins stressed the importance of having a publishing plan for your park because it lets you know where your publication fits in the large scheme of things. Don't rush to publish just because you can! I hear parks describe their volume of handouts and it makes me wonder if any of them could be eliminated or consolidated, if for no other reason than to save paper. Think about what medium your message will work best in; a publication isn't always the appropriate choice.

Finally, nothing in the graphic designer's repertoire is more valuable than knowing when to restrain fussy impulses. Freeman Tilden said it best: "The writer must have an instinct for compression of words—the artist cuts away all material not vital to the story....Too much excess leads to diffusion of interest. You have seen nothing because you have seen everything."

Appendix...

See the NPS Unigrid and Site Bulletin folders that are included in this package.

Color, Paper, Ink

Christina Watkins

As more and more forms of electronic communication develop, we are learning to appreciate what is different and valuable about printed pieces. They are portable, tactile, sensory, and personal.

Learn to exploit these positives through your choices of inks and paper with careful thought to the subject and your audience. These choices should be an integral part of your design process, not an afterthought.

Here are some guidelines to help you make these choices:

- One-color publications can be every bit as effective as multi-color ones. *Less* is definitely *more* where color use is concerned.
- Consider use and readability. Will this work outside in full sun? Will it be eye-catching in an appropriate way? Does the use of color relate to the subject and site?
- Use color breaks to carry different information, so that the reader associates a color with a message.
- Use a second color to enhance a theme. For example large dates in a second color could be a design element and a way of carrying the reader through a long historical text.
- Do not use color decoratively—save your money.
- Be careful of odd color combinations and reproducing photographs in a color.
- Colors have different values that make them come forward or recede; use accordingly. Find a printed sample of a particular color on a particular paper before you get to the printing stage.
- Paper is manufactured with many surface choices, from very soft, tactile felt to hard cast-coated. When you choose an uncoated, soft paper, be aware that your design will not reproduce as sharply as you see it in hard copy. Text, or uncoated, papers are wonderful communicators and come in a variety of textures and colors. Make sure that you see a printed sample on your choice of paper so that you can accurately visualize your finished product.
- Coated papers may crack on a fold, especially if there is heavy ink coverage. Ask the printer about this in the planning stage, if you are considering a coated sheet.

Paper choices in surface, texture, and color can profoundly enhance the information you are communicating. Explore all possibilities.

Sustainable Materials

Christina Watkins

In about 1455, when Gutenberg printed the 42-line bible with movable type and a printing press, he set in motion an information revolution. At that time, only 50,000 books existed in the whole world; a mere half century later more than 10 million volumes lined the shelves of government offices, universities, and homes.

I had the privilege a couple of years ago to see a demonstration of a Gutenberg press. A pressman in costume went through the process in the same painstaking way it was done 500 years ago. The type, locked in position, was inked with a hand roller from a tray, the paper was laid on the type, some padding added, the press screwed down, and then the crank handle pulled for the optimum pressure, then released. As the press was opened and the sheet of paper was removed from the type, there was a sort of kissing sound as it separated from the very tacky ink.

It was memorable, that sound, and it made me suddenly aware of the real reason we have turned this craft into a globe-polluting industry—speed. The pages printed by early printers were hung to dry and were not ready to assemble into a publication for days.

The striking thing is that there are still in existence 50 of these bibles, and they are mostly in very good shape. How can this be? Well, all of the *ingredients* were natural: The paper, inks, and binding materials had no additives to help speed up the process, hence no toxic chemical reactions that hasten the decomposing process.

After the Industrial Revolution, consumerism and accelerated business competition caused speed in printing to become a priority at the expense of the environment and the health of workers. Of course, printing wasn't the only industry that had these side effects, but it is this manufacturing process we are concerned with in the Information Design course.

It's certainly daunting to conceive of how you as an individual could have any effect on this global problem. The best way, as with any problem, is to begin taking steps one at a time. Every *little* thing you do with a concern for the environment counts, and you will begin to see more and more opportunities as you go along. You do not have to sacrifice the quality of your publications to achieve this goal.

Five Points to Keep in Mind

Here are five considerations for every job, big or small, that will help you create and produce responsible and meaningful communications.

1. *Should you publish?* This is the most important question you can ask. Why are you considering publishing a particular piece of information? Does something already exist that would do just as well? Just because this piece has been in print for years, do you need to reprint it? Could several items be combined to create a more effective communication? You are about to commit valuable time, energy, and resources to this project—take it seriously.
2. *Slow down.* Haste definitely makes waste. Mistakes are costly in dollars *and* to the environment. What is the *real* deadline? Be willing to take the time to do things well and justify it. How long will this piece remain in print? Is it worth sacrificing anything for some unrealistic deadline? Make a schedule, then build in a factor for comfort.
3. *Plan carefully.* Use foresight not hindsight. Plan with a printer to efficiently use paper; try to use the whole sheet by turning waste or trim into useful products printed at the same time. Choose the most appropriate means to produce the job. If your print run is small, for example, consider using a copier or some other low-tech, low-impact method. Some elements can be hand done simpler and with less waste of money, energy, and materials than a mechanized approach. (People are a resource to be considered too; there are groups of people, with and without disabilities, perfectly willing and capable of doing hand work which can provide a personal touch very effective in interpretive work). Develop a relationship with a printer that will allow you to work toward common goals through planning and choice of materials.
4. *Where will this publication end up?* How is it to be used? When you choose inks and papers consider whether the publication will be recycled or archived. Using recycled materials that can be recycled certainly is wise, but don't forget coatings, bindings, and covers. *All* of them have to be recyclable. Good designs can assure a longer life to some publications simply because readers will want to *keep* them. You do not want your efforts becoming litter!

5. *Are you considering the environmental bottom line?* Yes, at the moment, it can cost a little more to do things right environmentally; be willing to justify the need to send a message of commitment to the environment with your publications. Know that only demand from people like you will turn the tide and make environmentally responsible publishing affordable and the norm, not the exception.

Checklist

Here is a checklist of additional financial and esthetic considerations:

- Low resource impact (forests, water, energy, etc.)
- Low environmental impact (degradation of all natural systems plus pollution in workplace affecting human health and welfare)
- Sustainability (vegetable-based inks, recycled paper with high post consumer content, treeless papers such as kenaf and hemp)
- Recycled/recyclable (can you print this symbol in good conscience?)
- The closed loop (the ultimate goal in which nothing becomes waste, in which all products and byproducts of manufacturing are used for the same purpose or for another purpose.

Publishing sustainably is a subject that grows and changes daily as demand forces industry to make alterations in their procedures. Stay informed. You *can* make a difference.

Design for Non-Designers

Robin Williams

Robin Williams, an author and teacher who specializes in electronic design, conducted an all-day session on the second day of the workshop. She based her presentation on *The Non-Designer's Design Book: Design and Typographic Principles for the Visual Novice,* one of several books she has written. A copy is included with this handbook. Read it before going on to the other sections about graphic design. Notice how the four design principles in Robin's book are reflected in the NPS Unigrid and Site Bulletin guidelines.

Design Exercise

Melissa Cronyn, Christina Watkins

We've just had a call about an exciting development. The director of the National Park Service has announced a major event on the order of the wolf-release in Yellowstone Park: the long-awaited release of velociraptors in Jurassic Park has occurred and we thought, with all the obvious energy and imagination present in this class, that you folks would be the perfect people to team up, choose one of three media assignments, and develop in the next three hours one of these vehicles for announcing this event.

The choices are: a news release, a visitor information sheet, or a poster. See the proposed text for a news release, the park map and a list of possible sections for an information sheet, and the text for a poster. You may use or edit them as you like and create additional information.

The workshop participants at Cuyahoga Valley were divided into teams to complete this assignment. Do this assignment on your own or with a few colleagues at your park and/or association. Samples of what the workshop participants produced are available for viewing at www.nps.gov/chal/infodesign.

Appendix...

See the appendix for a press release about Jurassic National Park.

Mapmaking for Parklands

Megan Kealy

Megan Kealy is a cartographer in the National Park Service's Division of Publications at Harpers Ferry Center. She formerly worked for the U.S. Geological Survey in Reston, Virginia.

Have you ever had a bad map day? Have you gotten lost trying to use a map? Have you become lost and wished you had a map? Being lost angers and humiliates us.

What, you were born with a Global Positioning System unit in your brain? Navigation is an acquired skill. You aren't born with it.

Before I say anything else, I want each of you to draw a map for me now. Assume that you are busy producing some new park brochures with maps in them. But you want help with the maps, so you ask your chief of interpretation if you can bring me to your park to work with you. He or she says that with budgets tight, the only way to swing it financially is to have me crash at your home.

I agree to the lodging situation and arrive in the evening. We stay up late chatting about hard drives, RAM, how fast our computers are. Eager beaver that you are, you are up at sunrise chomping at the bit to get to work. Since I'm still sleeping—remember, I've been through two time zone changes—and since you are the perfect host or hostess and don't want to wake me up to tell me how to get to your office, you draw me a map showing me how to get from your home to your office.

(Spend no more than five minutes drawing a map. You will get much more out of the following material if you take the time to draw this map.)

Why did I have you draw a map before telling you anything about how to do it? As you can see this isn't brain surgery. However, having the park boundary and trails looking alike on your park map can cause serious problems. Harry the hiker drives to your park, looks at the map, and says, "Honey, here's a perfect hike, a nice circuit back to the car." But Harry and Harriet did not see the difference on the map between the park boundary and the trails, and at 4 p.m. they discover there isn't any connecting trail. They

are 6 hours, 3,200 vertical feet, and 2 mountain ridges away from their car. The only way back is the way they hiked in, but sunset is nearing and they have no flashlight, extra clothes, or food. It is not a pretty picture.

The reason I had you draw a map is to let you warm up your mind before I fill it with a bunch of cartographic rules and conventions. You just went through the process of making a map, and you are thinking, "this is pretty easy." You made choices of what to include and what to leave out. You drew lines and shapes representing things. You added symbols, names, and so on. It seemed easy because you drew the area you know best. How could it be unclear? What if I asked you to draw a map of Bosnia? How detailed would your map be?

The problem is this: Your visitor is not trying to understand the map. Your visitor is trying to understand the mapped world. As John McPhee once said, "In a conflict between the map and the terrain, the terrain is always right."

Your view of reality, reflected in the maps you just drew, tells a lot about your lifestyle, attitudes, and value system. Your map also tells us how far you commute. In one class a woman drew her route showing her walking to a bus, subway, and then to a boat to the Statue of Liberty.

Did you try to make your map uncomplicated so I would have no trouble finding your office? How did you try to achieve this? You probably showed features you consider important and left off unimportant ones. We all have a mental map of the environment in our heads. That's what you just based your map on. But this mental map tends to work best when our surroundings are familiar, and it often fails when we are thrown into a strange setting.

You need to keep an open mind when drawing your maps and to draw reality as accurately as possible, so that first-time visitors to your park get the benefit of your longtime personal knowledge of the park. But watch out for your biases. Don't leave off information such as one-way roads because you know there are road signs telling visitors which way to go. Visitors will never quickly grasp the layout of a complex developed area, such as Yosemite Valley, just because you made a nice pretty map as though the place were uncomplicated. People will move comfortably through your park only when the map they hold in their mind and the map they hold in their hands agree.

As I present my remarks look at the map you have drawn and compare it to my comments. As I describe the mapmaking process, see which steps you might be good at and which ones you may not be as good at.

See which ones you completely forgot or ignored. Then maybe the next time you make a map you will do it a little better.

For those of you who have not produced maps for publications, don't feel overwhelmed. We'll talk about the strategy, choices, and decisions you need to think about when making maps. You can learn a lot about maps in two hours, but learning computer software and staying current with it is another story.

What Is a Map?

A map is a human interpretation—an abstraction—of geographical reality. It's a simplified model of an area. It shows the location of things in space. Unlike a photograph, a map is not a physical record. And unlike a text, the character of an area can be presented immediately.

A map includes subjects of interest and frequently shows things that have no tangible existence, such as names and boundaries. It might show the continental divide, a conceptual line that you would not see on the ground. Features can be exaggerated, moved, or left out.

Though a map can serve many purposes, it should not contain all the information you would see in a photograph or on the ground.

Why Do We Need Maps?

The short answer is we live in a complex, detailed world. Maps reduce and rationalize our complicated surroundings to a simple representation. We all need to go places and we need to know how far it is to get there, and what we can do once we get there.

Maps are becoming increasingly more important to park visitors. As staffing shrinks, maps become a major link between the visitor and park management. The park folder becomes the visitors' guide in a car.

A friend of mine who works at Yellowstone National Park said a map is the first thing a visitor asks for when arriving at the park. Everyone is given a brochure and a newspaper, but only 5 percent of the visitors attend an interpretive program. So, all of you who are producing printed materials are important people. Your work reaches the most visitors.

Why People Can't Read a Map

There is one catch to mapmaking. Many people have trouble reading a map. Ironically people who successfully have traveled long distances to a park get lost a few miles down a trail.

Why? Maybe they never had to learn to read a map. Some people don't use maps. They rely on signs to get around. Parks are full of signs. You know the type of folks I'm talking about. They come into the visitor center, grab a map and push off for that personal experience in the park. They hike out a good distance and then they get to an unmarked trail intersection. The map shows it as a Y intersection, but they are standing at a four-way intersection. Suddenly their brain gets turned on and they ask, "Where am I?" Confusion sets in. They keep repeating over and over "I am here," and they start turning the map around, trying to figure out where they are.

After a few frustrating minutes they think they are lost and start to panic. They throw their hands up in the air and say, "This map is all wrong." Perhaps it is.

Our goal as concerned mapmakers is to make sure this scene never occurs. In truth, a variety of human factors could be responsible for this situation. The cartographer may have drawn the intersection incorrectly. The hikers' mental map of where they think they should be or want to be may be incorrect. A sign at the trail intersection may be placed improperly and add to the confusion.

There is a simple reason, however, why many people cannot read a map. They were never taught. Most people have never attended a map-reading class. Just as we aren't born with a knack to write, we are not born with a knack to read maps. It is a learned or acquired skill—like learning a foreign language. A map is a form of communication, and it uses a lot of symbols to portray information.

There is nothing magical about a map. As my college professor, Phillip Muehrcke, says: "The key is to assume a *bird'seye* position high above the region covered on the map. We must imagine what features would look like if viewed from above and at some distance. The problem is that we rarely find ourselves in the position of a bird. Therefore, maps show things in ways foreign to our everyday experience. Our usual location is the ground, where we see things from a side view. When these same things are shown on a map from a top (or *plan*) view, it can be quite difficult to match map features with local environmental features."

NPS-Produced Maps

Most of the maps I produce for park folders are for orientation purposes. They give an overview of the park and serve as a tool for the visitor to use in understanding and figuring out what to do while in the park.

To help me plan this presentation, I called a variety of parks and asked them to send me maps they created to hand out to visitors. I got a truckload of mail. Most of the maps were magnified views of a particular area in a park—what commonly is called an inset map on the Unigrid folders. These maps give visitors detailed information on roads, trails, streams, bridges, and other features to aid local travel.

These enlargement maps in publications are what we are concerned with mostly in this workshop, but the process works much the same for maps in your visitor center exhibits or on wayside exhibits.

How Do You Make a Map?

Professor Muehrcke once said, "What makes a map most useful is its genius of omission."

The reality you portray on a map should be uncluttered; only the essential information should be included. That is your job in a nutshell—to shape the jumble of reality into a compact, usable form.

To help you remember this important nugget of information, here is *Megan's Mapmaking Mantra: simple, clear, and easy to read*. This mantra works for little and big maps.

To make a map you need to know its components. To get great sound with a stereo, you need an amp, CD player, and speakers. To make a great map you need to know about map purpose, scale, the attributes of a map, and map design.

Map Purpose

I lied at the beginning of my presentation when I said you drew your maps with no coaching. I gave you the answer to the most important question you need to ask yourself before you make a map, and that is, what is the purpose of the map? Your map needs to have direction. Determining its purpose will help you limit the features to be shown on your map. A map can't show every detail; it would be a mess to read. Remember the mantra: simple, clear, and easy to read.

Those of you who are making maps for the first time should try to have the map serve only one purpose, such as hiking. Resist

the urge to have several purposes. As you get better, someone is going to ask you to make maps with multiple themes.

Maps with several themes work best if they share interrelated topics. For example, a fishing map might show zones where two kinds of bait—artificial lures and dead fish—are permitted and the trout seasons for rivers, mountain lakes and for valley lakes. It would be confusing to put other information, such as camping zones, on this map.

Other questions to ask yourself when planning your maps are:

- Must north be at the top? For consistency, I recommend that you keep north at the top of the paper. People are accustomed to seeing north at the top on highway maps and most other maps. If you can't do that, make sure you have a north arrow for people like me who assume north is always at the top. Most maps produced by the NPS Division of Publications with north *not* at the top have been remade recently with north at the top because of the confusion a different orientation caused.
- If you are printing information on the other side of the map, orient the material in the same direction. Do not force readers to turn the map sideways when they read the other side.
- Who is your audience?
- What is the area to be covered?
- What size paper will you publish the map on—letter, legal, or tabloid?
- What is the maximum scale that will fit on the page?
- Is the map part of a folder or your park newspaper? If it is, the map needs to work with the text in that publication.
- Do you really need to draw a map? Since maps don't just happen, save yourself the hassle and time, and ask yourself at the outset if a map is the best way to get your ideas across. There are many ways to communicate. Written directions might be simpler for a visitor to follow than a busy street map in an urban park. A piece of art might work better than a map, for it can show an entire scene more naturally from the side. A chart listing what facilities are at a particular location might be more effective than a map cluttered with pictograph symbols.

Taking the time to answer these kinds of questions initially will help set thresholds for the type of information to be mapped and help you select the information to show on the map.

Map Selection of Geographical Data

In the selection process you are deciding what geographical information to include on a map. To simplify matters, we will assume in this stage that you are just making informational choices, not design decisions on how to portray the information. As you gain experience, you will do both at the same time.

The selection process relates back to the map purpose: the more features you choose to include, the harder it will be to have a successful map. Remember the mantra: simple, clear, and easy to read.

Also keep in mind that the resource maps you use for base information were created with their own purpose in mind, so include only those features that relate to your map purpose and will help visitors get around. You are creating an interpretive map, not a reference map. Visitors usually don't need to know where park housing, the dump, sewage treatment plant, and county boundaries are. Sure, these places exist, but they are irrelevant—unless you think they will help the map reader.

Here's a tip to save yourself a lot of work up front and in future map revisions. Instead of showing the boundaries of other administrative areas that abut your park, such as a national forest, show only the forest name. That way you don't have to draw the linework and keep track of boundary changes.

If you are planning a hiking map in a mountainous area, consider if relief information should be shown, and if so, how—with spot elevations, contour lines, or shaded relief. Remember, many people don't understand contour lines. Also, edit out minor drainages—especially in arid areas.

On the other hand, be careful not to omit, eliminate, or manipulate vital geographical information. The resource map may not show all the features you need. You may need to merge data from other maps. And don't play God and change reality as a solution to a problem. For example, long ago the staff at one park that is located in two states separated by a third state suggested leaving out the middle state on the park map to improve the scale. That certainly would confuse visitors and prompt a lot of humorous sarcastic comments.

Remember the map purpose and the selection process later on when you are making changes to your map. Don't just keep adding things thinking you are making the map better. It may be better to make two maps.

Sometimes I think the hardest part of my job is negotiating with an interpreter, naturalist, or ranger who wants to add three more pictographs to a map legend that already has ten, which is too many anyway. I bet some of you think I am just being lazy and don't want to work when I say you can't have that many symbols on a map or that you must take off a symbol for every one you want to add. Duncan Fitchet, a compiler on many of the early unigrid maps used to say, "The length of the legend is a measure of the failure of the map."

After you have selected the features you want to include, you are ready to begin drawing the map.

Map Compilation

By drawing the map, I mean drawing a compilation, a rough draft of your map. This overlay really isn't rough like the sketch maps you just drew. It needs to be drawn accurately and should contain all of the geographical base data and names you plan to put on the map.

The compilation gives you an opportunity to preview the map, and for those of you who will be using a computer, the compilation is what you lay on the scanner bed to turn your drawing into a digital file or template for making your finished map.

Some of you probably are saying, "Wait, I don't do it that way, I download my data free from the Internet" or "My GIS techies save it for me and then I just clean up the file and add names" or "I have some software that is loaded with geographical base data that I select and use."

That is great; you are truly one of the blessed. But most of you—myself included—still need to scan a compilation and then digitize the linework. All this drawing and redrawing is the laborious part of mapmaking. So, for now, we will consider drawing a compilation a required first step. In the future, as more data bases are created, you will be able to buy the data you need and not have to scan or draw to get your digital file.

Here is another tip: *work at the scale your map will be printed at* so you won't be surprised when you reduce it and discover you put in too much information. This is the opposite of the old pen-and-ink days, when people tended to make their maps at a larger scale so their shaky linework would not show when the maps were reduced.

Getting Your Base Data

Whether you are drawing a compilation on an overlay or downloading digital data, the information selected to be shown on your map should be obtained from reliable base maps or digital files made with great detail, so that the information for your final map will be accurate.

Don't cut corners. Don't think you are smart enough to remember the location of everything in your park and then draw your map from memory as we did at the beginning. Believe me, you'll draw a bad map and then have to throw it away. Spend the time to be accurate. We all know time is in short supply, but it is easier to do your map right the first time than to do it over.

The easiest way to get appropriate base maps might be right in your park. Find the stash of U.S. Geological Survey topographic maps and check with the maintenance division for Denver Service Center maps showing current roads and facilities. Also check with your GIS staff. They may have already digitized your park boundary, roads, trails, and drainages.

Call the NPS Division of Publications at Harpers Ferry Center, where I work. We are digitizing all of the maps in park brochures. We are working on Macs using Adobe Illustrator to draw, color, and position names, and we use Adobe Photoshop for placing shaded relief art. We use USGS topographic maps and NOAA charts for our base materials. USGS Digital Line Graph data for roads and hydrography is available free at on the Internet at www.usgs.gov.

The Division of Publications also has a website (www.nps.gov/carto) where you can download the most recent park maps, along with recreational symbols, north arrows, graphic scales, road shields and other map resources. The data is available in two formats: Adobe Illustrator 6.0 for vector linework, color fills, type, and symbols. This is what you will need for making maps for site bulletins and newspapers. There is also shaded relief art saved in JPEG format. The best way to access the vector map files on a PC is with Adobe Illustrator 7.0, which offers cross-platform parity with previous Macintosh versions of Illustrator. Adobe Photoshop is required to open and manipulate the shaded relief files; it, too, is cross-platform. Detailed instructions on how to use NPS map data is available on the website. Also, the website allows you to e-mail us about questions or problems you may have.

Other government agencies to consult are the U.S. Forest

Service and the Bureau of Land Management. Commercial firms such as Trails Illustrated Topo Maps (see their website at www.trailsillustrated.com for an educational section on topo maps) and DeLorme Mapping, or scholarly publications also may have the information you need.

Always check the publishing date of your base maps to be sure they are current, and if they are not, update the information. Trails, parking and restroom locations always seem to be changing in parks.

Copyright and Maps

A benefit of using maps produced by the U.S. Government is that they are in the public domain and may be copied liberally without infringing on copyright. Maps produced by private companies and by our state and the Canadian governments are copyrightable and cannot be reproduced without written permission from the map producer.

Recently I was at a mapping conference where one of the sessions dealt with copyrights. The presenter, a former attorney who is now a practicing cartographer, said that to protect yourself remember this law: *facts cannot be copyrighted, but the way you express them can be.*

Where a river flows or a trail traverses is a fact and cannot be protected, but the way a cartographer chooses to show them is copyrightable. It is this arrangement or design of the information that renders a piece of work as original. It is a fine distinction, but an important one.

Many of the private firms use government-produced maps as their base material for coastlines, drainages, and boundaries, but the way they generalize the data may be protected. So, redesign your data—such as road shield positions, weight of linework, and colors—so it becomes your own, or copy design ideas you see on NPS Unigrid maps, which are not copyrighted. You probably cannot afford to go up against the big cartographic firms in court to find out whether the way you drew some line is fact or an expression.

Map publishers regularly add bogus information to maps—especially commercial city maps—to trap people illegally appropriating their data. They may use a fake middle street name that spells out their company name on street and plat maps, or add phony roads. So verify your data; if a street appears only on one map, it may be a trick.

Don’t photocopy copyrighted maps and hand them out. I

think cartographic companies are more concerned about photocopy violations than they are about copying data because every time you do this they lose a sale.

Large Scale Versus Small Scale

If the scale of the base map must be changed, *always work from the larger to smaller scale*. That statement can be confusing to some folks. A large scale map covers a small area and is more detailed—it would show a road crossing and recrossing a river as you would find it if you were driving it, whereas a small scale map would probably show the river always on one side of the road.

The reason you should always work from large to small scale is because map data, such as a shoreline, is generalized, and if you compile from smaller to larger scale you may be inadvertently introducing errors into the compilation.

For example, let's say you are making a map showing the location of backcountry campsites and portages for Isle Royale. Don't enlarge the state road map of the island to use as your base map for positioning these sites, for the shorelines have been smoothed out and details, such as coves and points that a canoeist needs to know, have been eliminated.

Also in making your compilation, *use base maps that are the same scale throughout the map*. In converting the Everglades National Park map to a digital map, I discovered the compiler 20 years ago used two bases with different scales. Thus, the generalization of the shoreline on the final map was not consistent.

Generalization

Cartographers call the process of simplifying the features you have chosen to map generalization. This smoothing and/or repositioning is most evident with linear features such as trails or water features. You may want to simplify the curves of a stream or the switchbacks on a trail, but try not to be sloppy and change the impression of reality. Remember our earlier hiker who was confused at the trail intersection. Show intersections as they really occur on the ground.

Repositioning features so that they are legible is helpful. For example, on the park map I drew for New River Gorge I moved apart the river, railroad, and road so they would not be touching and have some visual breathing room even though to be true to scale they should almost have been on top of one another. It's mantra time again: simple, clear, and easy to read.

Map Attributes

All maps share four attributes: scale, projection, symbols, and names. These four attributes describe the essence of a map's possibilities and limitations. The choices you make will determine how your map looks. No one can use or make safe and effective maps without understanding, or at least being aware of these attributes.

Scale

All maps are smaller than the reality they represent, and map scales tell us how much smaller. Somewhere on your map you should include a scale. Probably the most familiar type of scale is the graphic bar scale. It looks like a small ruler printed on the map.

Map users mark off the distance between two map locations on a piece of paper, or use their fingers, and then compare this distance with the graphic scale. This method is not very precise for a curvy route. For a hiking or driving map, stating the distance between points is probably the best way to indicate scale. I give distances to tenths of a mile for trails, and for driving routes I round off the distance to a whole number.

Always try to give both the English and metric distances, and, if that is not possible, give the metric conversion, i.e. 1 mile equals 1.6 kilometers.

Remember, if a map is reduced or enlarged on a photocopy machine, a bar scale or stated mileages will still be correct and change size in proportion to the map. However, other ways of expressing scales, such as a ratio (1:24,000) or a verbal statement (an inch equals a mile) will be wrong and useless once the map is reduced or enlarged. And if you make a map that is not drawn to scale, then state it: map not drawn to scale!

If the map is too cluttered to show distances between indicator points, consider using a distance chart.

Projections

Projections, the second attribute all maps share, convert the three-dimensional round Earth onto a piece of paper with two dimensions. On a small-scale map it is done by distorting properties such as shapes, distances, or directions.

Since most of the maps you will be making will be large scale, and if you use a reputable base map such as a USGS topo map, this distortion will be minimized and you will not need to worry about it. But let's say you are an interpreter at Everglades and wish to make a map showing the migratory route of birds that fly from North America to South America with a motel stop in the Ever-

glades. For that map you probably will want to consider using a projection such as the Robinson projection since it does not distort the shapes and sizes of the landmasses in the mid and low latitudes.

The Mercator projection is Eurocentric conformal. Never use it as a base map.

You also probably do not need to include latitude and longitude or section lines on your maps.

Symbols

Since showing all information as it occurs in reality is impossible to do on a map, cartographers have devised graphic symbols to represent features.

Many features have been represented the same way since the first cavewoman came running back from gathering berries and indicated to the loafing cavemen, by drawing lines in the sand for the rivers and making piles of stones for mountains, her sighting of the migrating elk. Upon hearing the news, the men leaped to their feet, grabbed their spears, and were off with a cry, but within minutes they were arguing about which pile of stones meant which mountain and lost track of the herd. And like normal, red-blooded men they weren't about to ask for directions. With that lost opportunity for a good food supply went their chances for survival, and the whole tribe perished that winter. Whoops, I am getting off the trail a bit.

This business of features being shown the same way for eons on maps is called *cartographic convention* and is what makes maps universal. People from all over the world can look at a park map and decipher a lot of information even though they may not speak English since much of the symbology is standardized. For example, we use a line for a road, a dashed line for a trail, a square for a building, and the color blue for open water.

If you need to invent a symbol, try to take advantage of the appearance of the feature so the map may be more easily interpreted. Don't forget the mantra—simple, clear, and easy to read. It applies to symbols, too.

Because you won't be present to explain your map to the visitor, you must have a legend to explain unfamiliar or unexpected symbols. You don't need to put familiar things like road shields in the legend. People already know what they mean. Think of legend space as precious and use it wisely to explain features that they truly wouldn't know without a definition.

Maps contain two types of symbols: point and line.

Point symbols refer to objects at a specific location. Cartographers use squares to represent existing buildings such as visitor centers, ranger stations, and lodges. They use dots to show nonstructural features such as mountain peaks, boat launches, campgrounds, and picnic areas.

Pictorial or pictograph symbols illustrate facilities or activities and should be treated as point symbols. When using pictorial symbols on a map, use the same designs that appear on your park signs. There is no good pictorial symbol for visitor center. The question mark and ranger station symbols just don't cut it.

Line symbols show the length of a feature such as a river, road, or trail or the shape of an area such as a park or a lake.

For a symbol to be recognized and not be confused with another symbol, vary the size, shape, visual texture, or color. With a point symbol you can vary the size of circles to show differences in the size of towns, or you can show importance by varying the sizes of buildings in the park to encourage people to go to certain places. At Harpers Ferry Center, we always make the visitor center square the largest size to attract visitors, and the symbol for the park headquarters, where you work and are not equipped to meet visitors, small. You can use a different shape to show the status of a feature such as a solid square for the visitor center or a hollow square for ruins.

With line symbols you can vary the width, visual texture, or color. In the pre-computer age we did not have much latitude in the design of linework. Now with a click you can dash lines and make parallel lines to show unpaved roads, or parallel dashed roads to show 4-wheel drive roads, or dotted lines to represent the continental divide. Try not to use a lot of different dash lengths to represent different kinds of features. Like Harry the hiker, no one will be able to figure them out.

Here are a few things to keep in mind when selecting symbols:

- Don't have too many symbols, especially lines and pictographs.
- Use different lineweights for different linear features. Interstates, for example, should be easy to distinguish from the other roads.
- Don't try to show every classification of roads and think it will still be easy to show drainages and boundaries. Believe me, you

will run out of differing lineweights the reader can recognize. A paved road is a paved road to the visitor. Try using only two thicknesses of roads and let the road shield tell the driver the class of the road.

- Remember there is a big difference between an unpaved and a 4-wheel drive road.
- Don't make a standard legend and plop it on all maps. Include only the symbols used on that particular map and make sure they appear at the same size and shape as they appear on the map.
- Do not have more than six items in a legend.
- Define in the legend only the unexpected or unfamiliar linework and point symbols. If a feature such as a drainage or a spot elevation is named, the visitor should be able to associate the symbol with the label and discern its meaning.
- If a feature such as a lookout tower or airport occurs only once or twice on the map, use a label; do not use a symbol.
- Make sure the wording explaining your symbol agrees with the signs in your park. Don't use the word motel, for instance, on the map if your sign says lodging.

Names

The fourth attribute maps share is names. Names identify where things are and need to be positioned carefully. If the cave people in my earlier example had spoken, or better yet had a written language, they would have named the rivers and mountains and not gotten confused about where the elk herd was. The naming of places works fine for a group of people until other people arrive. New people may apply new names or attempt to spell the old name in their language.

As a result of conflicting information on the names of places in the United States, the Federal Government in 1890 formed the U.S. Board on Geographic Names to standardize place names. The board is a part of the U.S. Geological Survey and is composed of representatives from many federal agencies to promote uniform name usage on all official federal maps and publications. This means the names we put on our maps should follow their decisions.

USGS topographic maps are an excellent source for the correct legal name of a feature. USGS also maintains for the board the Geographic Names Information System (GNIS). This database, which is available on the world wide web, contains information on

the Federally recognized name of physical and cultural geographic features in the United States. You may query the GNIS database at www-nmd.usgs.gov/www/gnis.

Recently the board has been involved in geographic cleansing of ethnic insults. (See handouts: one states the board's guiding principles and policies, such as no naughty or derogatory names on maps; the other is the form you can fill out if you want to make a name change.) The board meets once a month and about one-third of the suggested name changes are approved. You need a good case—such as local usage or a racial slur—to change a name. For example, Chinese Spring in the Old Faithful area in Yellowstone NP formerly was called Chinaman Spring, a name it got for a man who ran a laundry there at the turn of the century for the army and visitors.

Typefaces

The fewer the typefaces the better harmony you will have on a map. Try to use one typeface—at most two for those of you who must live dangerously. At Harpers Ferry Center we use only one typeface, Helvetica Neue, on Unigrid maps. To get contrast we use three weights: light, regular, and bold in roman and italics. That gives us six styles to choose from.

A subtle mapmaking convention most map readers never realize cartographers use is putting water names in italics. The slanted type suggests flow or motion. Lately we've been putting topographic features (mountain ranges, capes, and points) in italics for that organic feel and cultural features (towns, national forests, and road names) in roman for that manmade feel. Since park interpretive features are the most important names on your park maps, they are set bold.

Avoid condensed and extended fonts because they are hard to read. But do letterspace area names.

Size

Use the largest type size possible while maintaining good design. Use from four to six sizes at most to differentiate levels of information.

On a Unigrid map the park facilities and interpretive features are the most important. For example, we generally use a two point difference between type sizes and set the park name in the largest size (15 point); then the visitor center (10 pt); campground name (8 pt); boat launch (6 pt); park headquarters (5 pt). Five point is the smallest type size we use on a map.

Here are a few other reminders:

- Like symbols, names must agree with the signs in the park. The wording on the map also should agree with the text in the rest of the folder.
- You may need to break linework to make room for labels.
- Avoid using punctuation marks such as an apostrophe for feet. People may think it is a symbol.
- To cut down on clutter, abbreviate repetitive words such as feet with ft but do not use a dot or period after ft or mi or km on maps.
- If positioning the name of a campground with a pictograph campground symbol, don't use the word "campground." Let the symbol take the place of the word.

(See handouts: Mapmaking for Site Bulletins has further information on type placement; Map Style Sample illustrates the specifications for a sample map.)

Map Design

Design concerns the map's overall appearance. It is the stage where all components—purpose, scale, data selected, symbols—come together. How the map will be assembled—by hand or on a computer—plus time and costs involved in preparing and publishing the map are all factors affecting design.

You can have a clear purpose, good scale, and great symbols, but if the map elements are arranged poorly, the map will look bad and be difficult for the visitor to understand. A well designed map being used for its intended purpose should answer questions the visitor may have.

So what is a well designed map? Unfortunately I can't give you a prescription for every map because the purpose, scale, and data vary for each map. Let your creativity cells go to work. Imagine various options and develop an approach or plan. I can't stress enough that you need to plan what you are going to do.

Design means plan. Having a plan will help you answer a lot of repetitive design questions for each map you design. And a wonderful byproduct will be a corporate identity for your park.

A plan can help the visitor; they will become familiar with your design and probably make fewer map reading mistakes. A plan will allow your protegees to produce new maps with the same look. For ideas, look at what your colleagues are doing in other parks.

But please, don't go wild in your designs. Create credible maps. This is the biggest danger I see with noncartographers mak-

ing maps with the computer. Now everyone can create maps, but are they worth the paper they are printed on?

Try not to use your park maps to express your newly discovered art talents. For instance, don't use a string of snowflakes to indicate a crosscountry ski trail. Some visitor is going to look at that map and wonder if the mapmaker is flaky and untrustworthy. Remember, your credibility is at stake.

Create a file of thematic maps from *National Geographic* and other travel magazines. Look at atlases, books, and road maps. Many newspapers are creating maps on computers and can be a good place to get ideas for black-and-white maps, especially those that will appear on newsprint.

Remember you have decided on what to include, now, in the design stage you are deciding how to portray the features—weights of linework, should the lines be dashed or solid, what colors to use, etc. Then you organize all this information and voilà, you have a map. Actually, it is not that simple, you need to know about the graphic elements of map design.

Many books have been written about graphic design, and in particular, map design. To simplify this concept I am only going to tell you about the most important graphic elements you need to be aware of: legibility, balance, visual levels, figure/ground, pattern, and color.

Legibility

Lines, symbols, and names must be clear, sharp, and uniform. Make sure if you are going to photocopy your map that your design will hold up in the reproduction stage. Names should be large enough to read at normal viewing distance. If you are using color or patterns, make sure they are easily distinguishable. To aid in legibility the Division of Publications has been lightening or removing green from the park area on the Unigrid maps.

Balance

The positioning of such visual components as the title, legend, and bar scale needs to appear logical. Often they will fit in one area, but if there are various ways they could be positioned try moving them around and see what looks best. Avoid a classic beginner tendency—the Christmas tree look—of stacking everything on top of each other. In a well-balanced map, information isn't too close to the edge.

Visual Levels

This is the most important of the graphic elements. Since all of a map's information is presented to the reader at once, the information must be organized so the reader can sort it out and make sense of it. This is done by structuring the information into visual levels or layers (which is how Adobe Illustrator and some other drawing programs are organized), making more important features or shapes stand out. Try to strike a balance between your point and line symbols and names.

For a good example of visual levels think about the structure of a newspaper: headline, subhead, and text. Maps, too, should have visual levels.

Figure/Ground

This graphic element occurs with maps that show your entire park area, such as your park newspaper maps. They should be designed so visitors immediately recognize what they are looking at.

Cartographers do this by organizing the map into two impressions: a figure that is the focus of the map and is seen clearly (the park) and the background. The easiest way to create this is to add tone or color to one of the areas. Figure/ground can happen whether you are producing one-, two-, three-, or four-color maps.

Pattern

Use patterns sparingly because it is easier to go wrong than to go right. They usually show the extent of an area such as wilderness or closed areas. There are line, dot, and miscellaneous patterns such as those for swamp, sand, and lava.

Patterns need to be distinctive but don't use irritating ones that dominate the map. Lettering is easier to see against a shade or tone than against a line pattern. Also, consider using reverse patterns on a tone background; they won't interfere with linework or names. Select a pattern that will hold up in the final printing.

Color

Using a small amount of color can make a huge difference in making a map clear. Color is a symbol and can be used to show point, line, or area features and names.

I hate to say this, but a black-and-white map is much harder to design than a two-, three-, or four-color map because it limits your design options, which is why I've been promoting *simple* in my mapmaking mantra.

We can see a lot of colors, but our eyes are not very sensitive to the shades of one color such as black. Therefore don't design

differing classes of roads to be solid, 90 percent, and 80 percent black and expect visitors to remember what the shades of gray mean even though they are in the legend. Try not to use more than three shades of gray and separate them by at least 20 percent. Avoid using high percentages of gray for areas—say more than 50 percent—because they will make the map too dark, names will be impossible to read, and the map probably will print horribly.

Also, dark shades attract the eye and imply importance, but chances are the dark area is not the focus of the map. The lightest shade I would use is 5 percent.

Other cartographic conventions associated with color are: blue for water; red for major roads and safety messages; and green for parks. Yellow is not a good choice for linework or type, for it is hard to see. Remember the mantra—simple, clear, and easy to read.

When only one color can be used, most people choose black. If you print black on colored stock to give an illusion of two colors, try not to select too dark a paper. On a one-color Yellowstone site bulletin map (see handout), black is used for roads and trails, fat gray lines are used for drainage, the lake area is 20 percent black (with no shoreline) and the nonsubject area is white.

For two-color maps, such as those used in many park newspapers, selecting a shade of blue as your second color makes a lot sense for showing water features. Some parks have changed the second color for each printing so the staff knows immediately if the newspaper is current. Keep the blue; legibility for all readers is a more important reason than quick recognition by the staff.

Maps for Exhibits

Keep exhibit maps simple. Changes are expensive; you can't revise exhibits as often as you can publications. The less information, the fewer the changes. Also, if exhibit maps have a lot of information, people will stay at them longer and prevent others from reading them.

Exhibit maps generally are used for interpretation—to tell a story—or for orientation. Wayside exhibit maps often are oriented to the subject featured in front of the exhibit—a battlefield, for example—and not to the north. The map would be confusing otherwise.

Map Review

So, you've done everything I have told you to do, but there is one more thing to do: *review your map*. Give it to an office mate who

loves to criticize your work. You know you will have a winner if the person does not ask you its purpose.

Then, on the next beautiful sunny work day, do a field check. Take the map for a test drive and see if it works. Check the spelling of all names and compare them to what your park signs say. Make sure you have facilities located on the correct side of roads or drainages. Look at your road classes; are unpaved or paved roads shown correctly?

Look at other maps you are handing out or have posted to be sure you are using the same symbology or wording on your new map. Try your map on a photocopy machine. I guarantee someone else on your staff will run off copies, so you might as well be the first to see if the map holds up well on a copier.

After the map has passed all reviews and is deemed road worthy, put a date on it. Maps are perishable like milk. Adding a date will alert you that your map might need to be updated. Keep a file of changes suggested by colleagues and visitors.

Conclusion

Now, would you change anything on the map you drew at the beginning of this presentation? Besides all the cartographic rules and conventions, I hope that I've given you some practical advice. And please, keep in mind the mapmaking mantra: simple, clear, and easy to read.

Try to make your maps evocative of the landscape in your park. Try to create a sense of place on paper, because a map is not only a sign but a metaphor. Our maps should not only describe the lay of the land to those who have decided to walk to a ruin or check out a battlefield, but they also should inspire those who might not be so inclined or are unable to explore these areas.

Our responsibility is to be advocates of the parks and to help people experience the parks in more intimate ways than just driving through. Maps can lead to experiences that in turn lead people to understand more fully both the meaning of conservation and the government's crucial role in it. It was clear during the government shutdown that the preservation of the assets of the national parks, which cannot be measured merely by vast oil reserves or even crowds around Old Faithful, that parks are their own best advocates. Our job as mapmakers and interpreters is to reveal their obvious and subtle beauties.

Appendix...

See the appendix for more material on Mapmaking for Parklands.

Graphics Management

This workshop session was taught by Mark Wagner, Chief of Interpretation at Katmai National Park and Preserve, and by Judy Chetwin, Visual Information Specialist in the Southwest Support Office. Both of them have worked in a number of parks in the National Park System.

Mark's Graphics Management: File Formats *is followed by Judy's talk,* Choosing and Using Images*. The handouts from Judy's presentation can be found in the appendix.*

Graphics Management

Mark Wagner

File Formats

To get the most out of a piece of electronic clip art, you need to know the answers to the following questions:

- What is the file format of the clip art? Was it created and saved as vectors or as a bitmap?
- What software is needed to edit the clip art file?
- What application is going to be used to integrate this piece of clip art with text and other graphics?
- What file formats are compatible with the integrating application?
- Are tools available to make the clip art file compatible with the application?

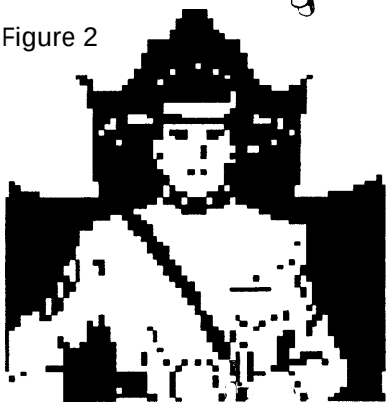
File Compatibility

When an application opens a file, it looks at the file header, the first part of the file data, to find out if the information can be used by the application—i.e. the computer is looking for a compatible file. If it checks the file header and finds what it is looking for, the application loads the data file into memory and displays the information on the monitor. If the file is incompatible, the application displays an error message, or loads the file and displays garbage.

Bitmaps

Figure 1

Figure 2



A bitmapped image is an array of dots, that is, it is thousands of dots in rows and columns. A bitmap is a lot like a halftone photograph in a newspaper. Enlarging a bitmapped image merely enlarges the dots; it does not add any additional information. Similarly, reducing a bitmap simply shrinks the size of the dots, but does not reduce the number of dots. See Figures 1 and 2.

The dots that compose the image in a bitmap are called picture elements or pixels. A pixel is the smallest definable part of a bitmap. A bitmap can be viewed, moved, enhanced, and otherwise controlled pixel by pixel, or a large group of pixels can be selected and controlled at one time.

Photographs, both color and black and white, must be brought into the computer as bitmaps in order to be used. Also, illustrations composed of many gray levels that blend into one another are usually created as bitmaps.

Paint programs, or bitmap editors, are used to create and edit bitmapped graphics. Scanners also create bitmaps.

Advantages of Bitmaps

- Bitmaps are easy to create and edit. With a powerful paint program (like Image-In and Zsoft's Publisher's Paintbrush) you get tools with which to edit bitmaps.
- Major bitmap file formats have been available for several years. Paint software publishers make their programs capable of opening or importing all these major formats and usually allow the user to Save, Save as, or Export to these formats.
- Most major desktop publishing and presentation software programs are compatible with these file formats in order to facilitate importing and exporting.

Disadvantages of Bitmaps

- Bitmaps are device-dependent—the resolution of the graphics depends upon the device with which it is viewed. If an image is viewed on a 72-dots per inch monitor, it will have a 72-dpi resolution no matter what resolution is used to scan it.
- Bitmapped graphics can be difficult to scale, select specific areas for enhancement, and position elements.
- Enlargement often yields very rough images. Reduction below what a monitor or printer can define will lead to a loss of detail as pixels are dropped out.

File Formats and Extensions

PCX

One of the most widely used bitmapped file formats, PCX was developed by Zsoft for use by Publisher's Paintbrush. PCX saves images in bilevel (black & white), gray level, and color.

TIFF
(Tagged Image File Format)

Developed by Aldus and Microsoft. "Tags" are identifiers at the beginning of each paragraph of code. The tags tells the TIFF reader (filter) about the content of that paragraph. TIFF files contain a lot of information and are usually larger than other bitmaps of the same image. The files are very complex, but handle the information in bitmaps extremely well. Current revision supports grayscale, RGB color, CMYK color, and data compression.

PICT

The PICT format was developed by Lotus to store graph information created by Lotus1-2-3. It is supported by many desktop publishing and presentation programs.

PNT

The PNT paint or bitmap file format was developed by Claris for use with MacPaint on the Macintosh.

BMP

BMP is Window's bitmap file format.

MSP

MSP is the file format designed for Macintosh Paint, an application that comes with the Mac.

Bitmap Tips

Before you create a bitmap, or enhance a bitmapped graphic, know where it is going to be used and the size at which it will be used. You can afford to enlarge a bitmap 10% or so if its a high-resolution graphic. You can also reduce it 10% to 20% depending on the image.

You cannot increase the resolution of a bitmap after its created. If you can scan an image at 600 dpi and print it out on a printer that only supports 300 dpi, then the resolution will be 300 dpi. On the other hand, if you scan an image at 600 dpi and print it out on a printer that supports 1,600 dpi, the image will stay at 600 dpi.

Save your files in a standard format that most software applications can read: TIFF for images intended for print output; PICT or BMP for multimedia or video; and TIFF and PICT for presentations.

Always use a three-character file extension to assist in easy identification of the file type, even for files that will only be used on Macintosh computers.

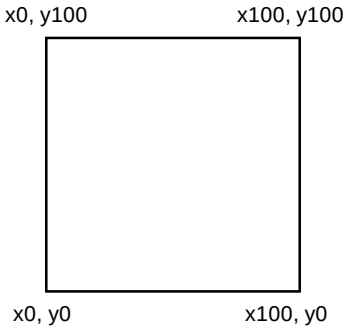
Software for Converting Formats

Sometimes a graphic or text file that you need is in a file format that cannot be converted by an application's import filters. Special file-conversion utility programs are what you will need. Programs include PictureEze (supports 25 different file formats), Apple File Exchange (for Macintosh) which also allows for cross platform conversions (Mac to PC ot Pc to Mac), and Transverter.

Vector Graphics

Vector graphics and object-oriented graphics are the same things. A vector is a mathematical formula that describes an object. An object is an independent element of a graphic that can be controlled without disturbing other elements of the same graphic. A vector graphic is a list of instructions that describes one or many objects to a device such as a printer. Each object has its own set of instructions.

In a vector graphic, an object or a group of selected objects in a drawing can be enlarged, reduced, copied, moved, and otherwise controlled without disturbing other objects in the drawing. Since the image instructions are not turning pixels on and off, the images are not device-dependent like bitmaps are.



A Box Drawn Using Vector Instructions

1. Place a point at coordinate x0, y0.
2. Place a point at coordinate x0, y100.
3. Draw a line between the two points.
4. Place a point at x100, y100.
5. Draw a line between the two points.
6. Place a point at x100, y0.
7. Draw a line between the two points.
8. Connect the first and last points.

Resolution

The resolution of graphics created using vectors is not device-dependent. When a command is given to enlarge the size of a box, the command for the thickness of the line around the box remains the same. Instead of saying that the line should be so many pixels thick, the command or instruction set says that the thickness should be a certain distance. The printer interprets the object instructions and outputs the image using its best resolution.

Advantages of Vector Graphics

- Objects can be integrated into a page layout and scaled to the optimum size without any loss of detail.
- When editing a vector graphic, several objects can be selected at one time, grouped, and manipulated.
- Many popular page layout, presentation, and word processing programs accept object-oriented graphics in several of the popular vector formats.

Disadvantages of Vector Graphics

- When it comes to scanning and editing scanned images, vector graphics are no help at all. A scanned image is a bitmap. Also if clip art is not layered, effective coloring or filling can be almost impossible.
- Scanned images can be traced and converted to vector graphics. But, if the image is composed of many separate pixel groups, the vectorized image file will be very large. Each pixel group will be an object and require a set of instructions. Such object files quickly become memory and disk hogs.

- Learning to use vector-based drawing programs takes longer than paint programs.
- Editing vector images, especially as it relates to closing paths, can be tedious and confusing.

EPS

EPS, or Encapsulated postscript files are easily imported by all major desktop publishing programs. It is the preferred Postscript transfer format.

Postscript is a page description language that allows the computer to talk to a printer, giving an exact description of everything on a page, including text and graphics. Postscript uses text as its language medium.

EPS encapsulates the page description text. An EPS file contains two versions of a graphic. The *main image* is a resolution-independent Postscript file that describes the image to the printer. The *second image* is a low-resolution, bitmapped preview that can be displayed on the screen.

EPS files should be created in the parent program.

Pitfalls of EPS

1. *overgrouping* - ungroup elements in graphics as much as possible to avoid “limitcheck” error.
2. *nesting EPSs* - an EPS within an EPS (e.g., you paste a piece of EPS clipart onto a page and then save the entire page as another EPS file).
3. *fonts* - text within an EPS should either be converted to curves or be sure that the font in the graphic is available when you print.

CGM

CGM, or Computer Graphics Metafile is supported by many draw, publishing, and presentation programs.

AI

AI is a postscript format for Adobe Illustrator.

WMF

WMF (Windows Metafile) is a format especially created for exchanging vector graphics between Windows applications using the clipboard.

File Integration

When a data file is created with an application, the data is saved to disk in the file format that is used by that application. The application might save the data in a standard format that is used by many

different applications. For example, Micrografix Window Draw saves data in DRW format, a format used by several different draw programs.

On the other hand, the application might save in a propietary format, a format that is peculiar to the application, and the application will open only files created in that specific file format. For example - Harvard Draw (HDW), Arts & Letters (GED), CorelDraw (CDR).

Integrating is bringing together files of different formats to produce one document, page layout, or presentation.

For Example...

You might need to incorporate the following files when building a QuarkXPress page:

File type	Application	Extension
Illustration	CorelDraw	CDR
Illustration	Arts & Letters	GED
Clip art	3G Graphics	CGM
Logo	Publisher's Paintbrush	PCX
Article	Word for Windows	DOC
Article	WordPerfect	Any extension

The following is one way to accomplish this objective:

1. After laying out the page, you begin importing files using Get Picture and Get Text commands.
2. The PC-Write text file imports directly. You may need to do some "massaging," but generally it comes in clean.
3. Quark has a filter for Word for Windows and WordPerfect, so you can choose a box and use Get text to bring them in.
4. Quark does not have an import filter for CorelDraw or Arts & Letters. But, both of these programs export to EPS file format. So, back in the draw application, you choose File/Export to EPS.
5. The PCX file is no problem. Quark has an import filter for PCX format, so just select FILE/Get Picture.

Choosing and Using Images

Judy Chetwin

Everyone is a writer, or so they think, but most people don't consider themselves artists.

This belief means that most people have words to put in their documents, newsletters, brochures, and cookbooks, but they don't have graphics. And if they do get graphics, they aren't sure what to do with them.

With thanks to Daniel Will-Harris, *WordPerfect For Windows*, September 1995, here are a few tips about using choosing and using images:

It's better to not use graphics than to use distracting graphics

No matter how good clip art is, if you don't choose it wisely, it won't add to your document and might end up detracting from it instead.

If clip art isn't applicable to your publication, don't use it. Use graphics because they *add* to the message you're trying to convey. Don't just add graphics because you want pictures on the page.

Use graphics only to attract attention, illustrate a point, or serve as a background

Graphics that attract attention are generally big, simple, bold, or colorful. A graphic that isn't instantly recognizable also can capture a reader's imagination. Our minds want things to be clear, so when we see something we don't quite understand, we stop for a second to figure it out. When fighting for a reader's attention, one second is all you need.

Graphics that illustrate a point help clarify your message. Looking at a picture is much easier and has more impact than reading words.

Graphics used as background can be accomplished with the Watermark feature in WPWin or with preprinted paper.

You don't have to put your graphics in square boxes

The biggest mistake people make with clip art is thinking that it has to be put in a square box all by itself like a picture on a wall. The more you can integrate the art into the page, rather than isolating it in a box, the more unified your page will be. Use contour wrap to make your text and graphics work together. (WPWin instructions:

To select contour wrap for a graphic, right-click the graphic and choose Wrap. Select Contour, then select the side or sides of the graphic you want the text to wrap around and choose OK.)

When looking for graphics, start with the style, then look for your topic

You can choose from tens of thousands of clip art images. There is more of it than ever before and the quality is better than ever. The best clip art doesn't even *look* like clip art anymore.

There are two simple keys to finding clip art that precisely meets your needs. Because so many collections cover similar topics, such as holidays or medical images, start with the style you're searching for, rather than the topic. This way you immediately narrow your search to the companies that offer the *look* you want.

So picture the style in your mind. Do you want modern, classic, period, formal, informal, geometric, freehand, black and white, or color?

Once you've narrowed your search to the style you want, you can focus on the topic you need. If you can't find the topic in a particular collection, most clip art companies will tell you if what you're looking for is in another of their collections. Many clip art companies will create custom images just for you. If you don't find what you're looking for, don't be afraid to ask.

Be stylistically consistent

Avoid the temptation to use graphics with many different styles in the same document. If you use one image in one style and another image in a different style, your pages will look like they came from a yard sale, which is not the impression you want to give—unless, of course, you're promoting a yard sale.

Using art of a similar style, or even from the same clip art package or illustrator, ensures that your document has a cohesive style that makes it appear more professional—and makes the art look more like it was commissioned and less like it's off the rack.

For example, one of my favorite sources of clip art is ArtParts. This company's style is whimsical and fun, but still professional. Its art looks like the graphics you find in magazines, because the artists are the same. They also have so many packages grouped by so many topics that you're sure to find something to enhance your message. The graphics are in WMF format, so they work with any printer Windows supports.

In graphic design and typography, there is no right or wrong, just appropriate or inappropriate

People are often worried about finding the "right" style. There isn't anything wrong with any of the clip art styles available. The "wrong" aspect comes in when you use an image style that doesn't fit with the message of your document. For example, you probably shouldn't use a freehand modern image with a very formal traditional report.

Find a style of art you like and build your page design around it

If you don't already have a graphic style in mind for a project, clip art can act as a starting point. Let's say you are creating a brochure and that you know what text you need inside, but you don't have a clear vision of how you want it to look. In that case, clip art can give you a jumping-off point or a stylistic spark to start from.

If the art out of the box doesn't exactly fit your needs, change colors or edit graphics

If you find an image that's perfect except for the object in the corner or the color used, you can edit it (with WPDraw). This works for any vector graphics (but not bitmapped) such as .WPG or .WMF graphic files. (WPDraw instructions: To edit a graphic, simply double-click it. In WPDraw, or Presentations 3.0, you can select different objects and delete them, move them, size them, or change their color.)

You can edit bitmapped graphics (such as .BMP, PCX, TIF files) in Presentations 3.0 or by retrieving them into a graphics program, such as the Windows 3.1 Paintbrush accessory.

At first, using graphics might not come as naturally as using words, but before long you'll get the hang of it and be a veritable graphics guru.

Using Clip Art

Good Planning

As with most things, good planning will serve you well in deciding which graphics to use and where they should be appear in the text. Here are three planning tips:

1. It's a good idea to write the entire text of the project and format it the way you want it to appear *before* adding graphics.
2. As with spices, more is not always better—so plan each page carefully. Too many graphics can clutter a page. Use restraint. When deciding between two or more graphics, favor the simplest.
3. Place graphics in your project starting from the beginning of the document. The placement of graphics changes how the

text and columns, etc., flow on later pages.

4. Don't underestimate the value of white space. Whether you're contouring text around a graphic or placing an image, respect the need for margin space.

Rule of thumb

Match the tone of the clip art to the tone you want a document to convey. Making a flier for a day-care center? Use whimsical, engaging images. Producing an annual report for a non-profit organization? Try businesslike, elegant images and typographic ornaments. You get the idea. Use your judgment to decide which clip art is most appropriate for any given project.

Here are some general guidelines to help you choose the proper clip art for your projects.

Newsletters

Images should enhance the message of newsletter articles. Avoid cute or cartoonish images in a serious, businesslike newsletter. As filler, however, consider full cartoons—but avoid cartoon-like illustrations when you're trying to make a businesslike impression.

Producing a newsletter takes time to master. After you've addressed the critical issues of font and layout, don't overload your creation with graphics. If you wish to use scanned or converted photographs, be sure they will reproduce well.

Presentation Slides

Choose images that enhance the message on each slide. You don't want to say the same thing twice on a slide, so avoid purely ornamental images, except as graphic elements. Including visual aids in your presentations adds impact. Colors are best used as vibrant, solid fills bordered by distinct black lines. Images should be colorful but not busy. Using subtle, textured backgrounds is acceptable if your text is clear and easy to read. If the background coloring is dark, use white text; if the background is light, use a dark or bright text color that will stand out.

Fliers

Fliers are meant to grab attention, so you can go a little wild. Even if it's a low-budget project, choose an attention-getting cartoon or bold image. Try colored paper for added visual impact. Limit other colors to small areas so it draws the eye without creating visual confusion. Use short words in your headlines and work around a single, engaging central image.

Design elements/dingbats	Look for simple, elegant images. Good choices are contemporary line art, picture fonts, typographers ornaments or leaves.
Menus, catalogs, price lists	Use art that illustrates text or ideas on the page. Illustrations are fine. Make sure the images you choose fit the tone of the document. These kinds of documents can be either colorful or subdued.
Proposals and reports	Use images only where they supplement the text. Avoid purely ornamental images that don't contribute to the document's message—unless they're typographers ornaments added for an elegant look. Tables, charts, and graphs are often critical to a proposal's success. Such graphics should be colorful and easy to understand. Simple clip art can often be added to charts and graphs for added emphasis. Use images to supplement text—they're often easier to understand than long verbal descriptions. Small black-and-white clip art images can be used as bullet markers to accent sections.
Documentation	Choose images that reinforce or illustrate topics in the text. Art should communicate, so avoid ornamental images. Reference manuals and instruction guides should be straightforward and uncluttered. Black-and-white diagrams, photos, and bold clip art images that can be understood at a glance are effective. If gray-scale graphics are incorporated, the fewer the shades, the better.
Brochures	Most brochures are short on space, so choose simple, impressive images that will retain their qualities when reproduced fairly small. Intricate and complex graphics may be appropriate here. Flowing text around illustrations is common, but you may even want to consider placing text over a subdued graphic.
Appendix...	See the appendix for more material on Graphics Management.

How to Work With Printers

Robert M. Petersen

Robert Petersen was a sales representative of Lorraine Press in Salt Lake City. Lorraine Press has printed hundreds of publications for cooperating associations. Bob passed away in 1998, leaving a legacy of enthusiasm for helping cooperating associations and the parks that they support.

The first step in accurately communicating with a printer is to establish a strong working relationship. You will find a good printer will guide you to the best buy in paper stock and the most efficient means of production. A good printer will guide you through a myriad of other details that will enable you to produce quality jobs, on time, and within your budget. There are far more savings to be gained by working closely with a printer than by choosing the low bidder from numerous quotations.

By carefully examining the following request for quotation, we can determine the information required for a printer to plan the job and prepare a fair and accurate estimate. It is important that you understand the specifications and supply accurate information, so the printer can do what you want done and so the printer can make suggestions to cut costs without sacrificing quality. Remember, the price is based on your specifications, and variations from the specifications are chargeable as author's alterations or manufacturing variances.

A basic request for quotation follows the production flow of the job through the plant. It starts with the customer's name and project name and goes through quantity, size, number of pages, furnished materials (pre-press), press, bindery, and shipping.

Here is a composite of several quotation forms. The items have been numbered for easy reference.

Request for Quotation

1. Date: 00/00/00
2. Publisher: Beautiful and Historical NP
3. To: We're the Best Printing Company
4. Project Title: Dangerous Furnishings Trail Guide
5. Quantity: 2,500 or 5,000 copies plus additional thousands

printed at the same time

6. No. of Pages: 16 plus 4-page cover
7. Trim Size: 5½x8½ bleed
8. Stock: Cover—80# Ajax cover (recycled). Body—80# Ajax text (recycled)
9. Furnished Materials: Job will be furnished on 3½ disks (Quark). Ten 5x7 B/W prints furnished. Printer to scan as duotones and place. 1 to be outlined.
10. Proofs: 1 Dylux, 1 Waterproof
11. Printing: Text pages will be printed in two colors, black and PMS-480 brown throughout. Covers printed black and PMS-480 brown one side only.
12. Binding and Finishing: Covers to be scored. Trail guides to be folded, gathered in sets, and saddle wire stitched.
13. Packing, Shipping FOB Point: Trails guides to be shrink wrapped in 25s and packed in cartons not to exceed 35# FOB your plant.
14. Schedule: 3 weeks ARO (after receipt of order).
15. Additional Information: Quote due no later than 00/00/00. Fax to 000-000-0000.

Items 1, 2, 3, and 4

These items are self-explanatory, but they are important, so a printer will not confuse projects.

5. Quantity

State realistic figures for the quantities you are considering printing. Occasionally we receive quotes requesting prices for 1,000, 3,000, 10,000, 25,000, 50,000, and 100,000. This is not a logical progression of quantities and quite obviously there is a great difference in the production methods between a 1,000 and 100,000 quantity job. Drafting an accurate estimate is a time-consuming job; don't burden the printer with unnecessary figuring. A typical quotation should request two or three quantities and a price for additional thousands printed at the same time.

6. Number of Pages

A page is defined as "one side of a leaf in a publication." One leaf has two pages. One sheet folded in half yields four pages. A 16-page signature has eight pages printed on each side of the sheet. When requesting quotations for books or booklets, *always specify the number of pages*. Specification of leafs will result in a price for half the number of pages you require.

7. Trim Size

This is the final trimmed size of the publication or piece. For example, the trim size of the described booklet is 5½x8½, not 8½x11 folded in half. If the job were a single piece it could be described as: trim to 9x12 letter fold to 4x9.

8. Stock

Long before you sit down to your computer and fire up desktop publishing to create a prize-winning publication, give some thought to paper stock in relationship to the finish size of the job you intend to produce. To arrive at intelligent decisions it is well to have a basic understanding on how paper is sold and of paper sizes.

Basic understanding indeed! Two terms you will encounter dealing with paper are “basic size” and “basis weight.” Basic size is defined as: “The standard size of sheets of paper used to calculate basis weight in the United States and Canada.” Each category of paper, such as bond and book, have a basic size. Common basic sizes are:

Bond, writing—17"x22"
Text, book offset—25"x38"
Cover—20"x26"

It follows that basis weight is the weight in pounds of a ream (500 sheets) of paper cut to a given standard size for that grade. For example, 20"X26"—80 cover will weigh 80 pounds per 500 sheets. Paper is sold by the pound and that price often is converted to price per 1,000 sheets for estimating purposes. The sizes commonly stocked by paper merchants are:

Bond—17"x22", 17x28", 22"x34"
Text, book, and offset—23"x35", 25"x38"
Cover—20"x26", 23"x35", 26"x40"
(The last dimension is the grain dimension.)

It is important to plan your job so it will cut economically out of one of these parent sizes. It is not unusual for printers to receive jobs ready for output to film and find there is not a sheet of paper available that will print the job without waste.

At the very beginning of the job, you should contact your printer to find out what stocks are available and in what sizes and most economical cuts. Paper merchants will be happy to supply sample books as well as 12"x19" sample sheets of their stocks. When selecting paper, remember the cost difference between a mediocre and a number one stock is a small part of the job cost.

This also would be a good time to find out the printer's pre-press, press, and bindery capabilities and request an equipment list.

9. Furnished Materials

Here is a great area in which to save money, and it only takes a telephone call. Before you spend hours on the computer, talk to your printer's electronic pre-press technicians. Explain the job, what equipment and software you will be using and how you plan to produce it. He can tell you what formats he can accept and will have valuable suggestions for saving time and money. Often the printer will have some very sophisticated programs—for instance trapping programs—that can do the job better and faster.

When you supply a job that has been prepared electronically, the following should be sent to the printer:

- Full size laser proofs with color breaks and FPOs (for position only) indicated. Laser proofs should reflect the current file, and it is recommended the publisher make corrections.
- A list of all fonts used in the electronic files by name and manufacturer.
- Both the screen and printer fonts for *all* fonts used.
- All files used to create the document.

In addition, make sure to:

- Specify all colors as spot or process.
- Allow for all bleeds.
- Include materials the printer will scan, i.e. prints, transparencies.

In the process of producing your job, call the printer with any questions.

10. Proofs

The standard proofing for one- or two-color work is the Dylux or blueline. The second color is usually indicated by a lighter burn or a screen value. For multi-color proofing (two or more colors), Waterproof and Matchprint are available. Unfortunately the range of PMS colors available in the these proofing systems is limited, so some imagination is required to read a bright green as a pastel green.

11. Printing

Specify the number of colors as well as the colors themselves. If all colors are PMS, an extra wash-up may be required. Certain colors such as metallics and very light pastels require additional make-ready time. Four color process is specified as 4/C process. In this section also include such things as press varnish, aqueous coating, and UV coating.

12. Binding and Finishing

Describe the type of binding you desire. For books and booklets the options would be:

- Saddle stitched in which staples are inserted through the folds
- Perfect bound in which the backs of the signatures are cut off and an adhesive applied
- Smyth sewn in which individual signatures are sewn through the fold before binding so the publication can lie flat when open.

Ask your printer about other options, such as folding (letter, right-angle, accordion, parallels, gate), drill, pockets, score/perforating, stamping or embossing, and die-cutting.

13. Packing, Shipping, and FOB Point

Decide how the job should be wrapped and shipped. If it is to be stored for some time, shrink wrapping provides excellent protection and inventory control. Always specify the weight of cartons. Not only do smaller cartons protect the product better, but moving heavy cartons is an unpleasant task. Specify FOB (free on board) point, the destination to which you want the publications shipped.

14. Schedule

The old saw is the printer has three things to sell: quality, price, and delivery; the customer gets two, and the printer gets one. Allow the printer a reasonable time to do the job. If you are not in a great hurry and allow the printer the option of fitting in the job between other jobs, you might get a better price.

At the start of a printing job, tell a printer what you want, and let the printer tell you how to accomplish what you want. Near the end, when reviewing proofs, ask questions about what you think is wrong, such as the sky is not blue enough in a particular photo, but do not tell the printer how to resolve the problem. ***Ask questions; don't give instructions***. In the proofing stages, you pay for any editorial and design changes. The printer pays for any legitimate printing adjustments.

GPO's Deskstop Publishing Guidelines

Les Greenberg

Les Greenberg is a publications media specialist for the Institute of Federal Printing and Publishing, U.S. Government Printing Office, Washington, D.C. He also teaches classes in the Publications Specialist Program at George Washington University.

The Government Printing Office has published a new pamphlet, *Guidelines for Preparing and Submitting Electronic Design and Pre-Press Files*. These guidelines were compiled from experience with thousands of projects and examination of similar guidelines from various service bureaus, printers, and trade associations. A copy of this pamphlet is enclosed. NOTE: This is a two-part pamphlet that reads from both front and back.

By following these guidelines, the Government Printing Office (GPO) and its contractors can produce higher quality publications and do so in a timely fashion and without extra charges. You also will not have to be contacted to clarify questions about the materials you submitted for printing.

Copyright Basics

Pam Frazier

Pam Frazier is assistant director/publications manager of the Grand Canyon Association. She formerly worked as an interpretive exhibits and publications specialist for the East Bay Regional Park District in Oakland, California.

Copyright is the protection of original work ("intellectual property") expressed in a fixed form. The owner of the work, or copyright, has the right to control how the work is used.

Copyright takes two forms:

- Common-law copyright automatically protects work as it becomes "fixed."
- Formal registration of ownership filed with Copyright Office by completing the proper form and sending it to the Copyright Office of the Library of Congress together with two copies of the publication and a $20 fee. This process is *not required* for protection but offers some legal advantages should an infringement suit be filed. Register copyright within three months of publication.

Five Exclusive Rights

Think of copyright as a bundle of rights, similar to a bouquet of flowers. Each flower represents one of the many rights protected by copyright, all of which belong to the creator of the original work. The basic bouquet consists of five exclusive rights:

- To reproduce the work by any means.
- To prepare derivative works, such as slide shows and illustrations in a book, based on the copyrighted work.
- To distribute copies to the public for sale or lease.
- To perform.
- To display the work publicly.

Any or all of the rights may be handed over (transferred or assigned) by the creator to another person or entity who then is entitled to control that individual or collective use. This transfer can be terminated by the original owner.

Possession of the work itself (photograph, painting, story, poem, journal, letter, manuscript, etc.) does not bring with it the right to control how it is used. For example, an artist could give a painting to a

person but not give that person the right to control its use in a publication or an audiovisual show.

The different parts of a single product may be copyrighted to different owners. In a book, for example, the text may be copyrighted to the author, photographs to the photographer, and all additional material (foreword, introduction, annotations, index, cover artwork, etc.) to the publisher or someone else.

Two Copyright Laws

January 1, 1978, is a pivotal date in copyright law. Prior to that date, copyright protection was governed by a law which became effective in 1909, and still applies to work published before 1978. March 1, 1989, is another significant date. Various protections related to these dates are listed below.

The 1909 Copyright Law

- Applies to all work "published" (see Definitions below) *before January 1, 1978*.
- Required "proper copyright notice" on publication to be valid.
- Allowed the transfer of copyright to be done orally.
- Set a copyright term for a "published" work of 28 years from date of publication; the copyright was eligible for one renewal of 28 years for a total of 56 years. (If copyright was in its first term at the time 1978 law became effective, Congress gave a one-time renewal of 47 years, for a combined term of 75 years.)
- A work that was "created" before 1978, but not "published" before 1978, is protected until at least December 31, 2002.

The 1978 Copyright Law

- Applies to all work created on or after *January 1, 1978*, whether published or not.
- Requires proper copyright notice up to *March 1, 1989*. After that date, protection is valid even if notice is missing; though "proper notice" is no longer required, it is recommended to avoid "innocent infringement" defense.
- Requires that any transfer of "exclusive" rights be in written form, signed by the copyright owner (transfer of non-exclusive rights need not be written to be valid). It is advisable to formally register transfers of rights with the copyright office.
- Sets a copyright term of the life of the creator plus 50 years (if creator is anonymous or pseudonymous, the term is 75 years).

Work Made for Hire

Work done by an employee as part of his or her position description or regular terms of employment is called "work made for hire." Whether or not a person can be considered an "employee" is determined by such considerations as where and when the work is done, who sets the hours, how work is supervised, who provides the tools, materials, and equipment, can additional tasks be assigned to this employee, who pays and how is payment made, are benefits paid, etc. If work is indeed "made for hire," use rights belong to the employer.

"Commissioned" work cannot be equated with "work made for hire" unless the creator has signed a written agreement to that effect, or the work was done by an employee (see previous paragraph). When you commission work (photographs, illustrations, writing, etc.), fees can be negotiated based upon the extent of rights you wish to control. You can expect to pay less for the rights to limited use, and more for a wider range of uses. (See the appendix for a handout reproduced from *By the Book* by Martha Blue.)

Public Domain

Works are considered to be in the "public domain" for one of several reasons and therefore are not protected by copyright:

- Copyright is lost or expired
- Published before 1978 and did not contain proper copyright notice
- The work was created by a federal employee as work for hire
- The work is not eligible for copyright protection (see Copyright Office Circular 96 §202.1).

Works in the "public domain" may be used without permission, but cannot be copyrighted. A publisher of "public domain" material can copyright only original material that has been added (e.g. new illustrations, foreword, interpretations, index, etc., that were not part of the "public domain" work).

Note, however, that government-produced publications may incorporate copyrighted work (e.g. photographs or illustrations that are copyrighted by the photographer or illustrator), so one cannot assume that a government publication is usable in its entirety. It is imperative that government-published works adequately protect the copyright status of work contributed by non-government "creators" by providing appropriate copyright notice.

Fair Use

The "fair use doctrine" allows for limited use of copyrighted material without permission under certain circumstances, such as distribution for educational purposes.

There are no black-and-white guidelines for "fair use," but you can assume that any use that will affect the owner's profits or the product's marketability will not be considered "fair."

Using Collections

As noted earlier, possession of a work (photograph, painting, story, poem, journal, letter, manuscript, etc.) does not bring with it the right to control how it is used.

If you have access to a collection of works, do not assume that you are free to use it in any way you choose. Check accession records first to see what rights, if any, have been assigned to your organization and in what ways use may be limited.

Definitions

Here are a few definitions to help you understand copyright restrictions:

Copies Material objects, other than phonorecords, in which a work is fixed by any method now known or later developed, and from which the work can be perceived, reproduced, or otherwise communicated, either directly or with the aid of a machine or device.

Created A work is created when it is fixed in a copy or phonorecord for the first time.

Creator The person, persons, or entity that brought an original work into fixed form.

Fixed A work is fixed in a tangible medium of expression when its embodiment in a copy or phonorecord, by or under the authority of the creator, is sufficiently permanent or stable to permit it to be perceived, reproduced, or otherwise communicated for a period of more than transitory duration.

Proper notice This term refers to a notation on the work that informs readers/users that the work is protected by copyright and includes the year of copyright and name of copyright owner: e.g. Copyright 1995 XYZ Natural History Association. This notice should appear in a predictable place, thereby assuring that the reader/user will see it.

Publication The distribution of copies or phonorecords of a work to the public by sale or other transfer of ownership, or by rental, lease, or lending. A public performance or display of a work does not of itself constitute publication.

Budgeting for Publications

Pam Frazier

In discussing budgets for park and association publications, I have to make some assumptions. I assume that park employees are producing free publications for visitors and that cooperating association employees are producing free and sales publications. Whether the publications are free or for sale, many factors in their budgeting are similar.

Several workshop speakers have mentioned this already, but it bears repeating: the earlier in the process that you establish a relationship with a printer, the better the final product.

A printer can give you advice that will save you money in the long run. For example, a printer can give you advice about paper sizes that can reduce waste and costs. With that information ahead of time, the designer might be able to plan the publication to be a little smaller or a little larger and not waste paper—or money.

Development and Printing

For a sales publication, I generally figure that the retail price will be three times the cost. It will be more than that if you are going to be wholesaling some copies to concessioners and other nearby outlets. If you are going to be selling half of the copies to a wholesaler for wider distribution, the retail price might have to be five times the cost. You might give the wholesale distributor a 55 percent discount, and the distributor probably will give the retailer a 45 percent discount. The point is that you have to take these factors into account at the start of a project, so you can figure out the budget for a publication.

Of course, there are many other factors to consider ranging from the costs for the writer and the editor to the fees for illustrations and all the design work. About 25 to 40 percent of the budget is spent in the developmental stages before you send the job to the printer.

Costs to Consider

Here are some elements in the publications process that can cost you money:

- Author—flat fee or advance and/or royalty
- Editor—minor copy editing or major editing, rewriting
- Expert reviewer
- Illustration—flat fee or advance and/or royalty
- Photos (prints & rights, contract shoot)
  Drawings (rights, contract illustrations)
  Maps
- Diagrams, tables, charts
- Design—flat fee, or fee plus out-of-pocket expenses (e.g. telephone/fax, courier)
  Thumbnails (small drawings showing how elements flow from page to page and how many pages there will be)
  Comprehensive layout (full-size mockups of a few sample page spreads and the cover)
  Text design elements (titles, subtitles, body text, captions)
  Cover design* (this should be approved by marketing personnel)
  Illustrations*
  Maps*
  Charts*
  Typography*
  Camera work/computer scans*
  Camera-ready artboards or films (mechanicals or computer-generated)
  Press check travel & expenses*

Other:

- Indexing
- Printing, paper, color separations, binding
- Tax
- Shipping

Some designers handle all of the elements listed and include them in their fee. You may wish to handle the elements marked with * and furnish them to the designer for inclusion into the final production. Be sure to clearly define which elements you are expecting from the designer.

Free Publications

For example, the park newspaper might be the most important publication the association produces for the park. It contains important information that the visitor wants to know and important information that the park managers want the visitor to know. We print 1.3 million copies a year costing more than $60,000.

Most free publications, of course, are not distributed in such large quantities, but they still take time and money to develop and print, so you should take each of them through the budget process. Free publications serve a vital function in most parks and are reprinted year after year. You have to budget for those reprints—something many park and association people tend to forget.

With free publications, talk with the Government Printing Office or your private printing firm about using one of the least expensive papers and other ways to reduce costs. Sometimes you can suggest donations for free publications and get back most of your printing costs—not developmental costs.

Besides considering the cost elements I mentioned earlier, look at the handout on *Variables in Cost to Publish* for other factors to consider, especially in the manufacturing stages. The other handouts work as a pair: the first one lists a publication's specifications so a printer can make an estimate on a publication project; the second one is an estimate for that project.

(Also, read the section in this handbook on How to Work With Printers.)

Government Contracting

Thomas M. McConnell

Thomas McConnell is a contracting officer for the National Capital Support Office. Prior to joining the National Park Service in 1982, he worked in the contracting office of a major construction firm in Virginia.

What are the responsibilities of the various participants in the Federal Government's acquisition process? Some National Park Service employees get involved in the process but are not sure what their responsibilities are exactly.

Role of Program Personnel

Program personnel are those individuals requiring services/supplies from a contractor. They can be chiefs of interpretation, resource specialists, safety officers, and other personnel.

The function they perform is an integral part of the acquisition process. They are responsible for:

- Identifying requirements for goods and services.
- Coordinating plans early on with the appropriate acquisition personnel.
- Developing requisitions for individual requirements that clearly and adequately state what is needed and when it is needed, and that contain an in-house cost estimate, a source of available funds, any required justifications, and other relevant information.
- Assisting in the administration of the contracts formed.

Role of Contracting Personnel

Contracting personnel (contracting officers, contract specialists, purchasing agents, administrative technicians, administrative officers) are responsible for handling acquisition transactions and ordering from established sources. Specifically, they are responsible for:

- Determining the appropriate source of supply; if necessary, finding sufficient prospective commercial sources to obtain competition and satisfy socioeconomic and other requirements.
- Advising sources of Federal Government requirements.
- Evaluating quotations, bids, and proposals and conducting negotiations to obtain fair and reasonable prices.

- Preparing appropriate acquisition documents.
- Following through to see that end users receive what is needed, when and where it is needed.

The role of the contracting officer is a challenging one. Contracting officers need to exercise sound judgment in making the best buys, based on price and other factors.

Most contracting officers need to be generalists. They need to be familiar with a wide assortment of commodities, industries, supply systems, and acquisition techniques. All must be familiar with a host of requirements and procedures ranging from provisions of the regulations to detailed instructions for using various systems and catalogs and forms.

Moreover, they must be able to recognize circumstances in which a complex requirement, or a requirement subject to special handling procedures, should be referred to higher authority.

Appendix...

See the appendix for material related to government contracting.

Working With Cooperating Associations: Publishing With Partners

This session of the workshop was taught by Pam Frazier of Grand Canyon Association and Steve Kemp of the Great Smoky Mountains Natural History Association. Though they gave their presentation jointly, their talks are presented here separately.

Working With Cooperating Associations

Pam Frazier

The first national park cooperating association (CA) was established at Yosemite National Park in 1920, just a few years after the National Park Service itself was formed. Already it was apparent to Park Service officials that the government would not be able to furnish visitors with all the information and assistance they needed and wanted when they arrived at the parks.

The Service needed support, and the U.S. Congress chartered cooperating associations to provide that support. CAs are private nonprofit organizations operating under cooperative agreements with park units, and with guidance from NPS(DO)-32.

Mission Remains Same

In the early years, cooperating associations often were run by park personnel, but in 1987 a government solicitor ruled that government control of a private nonprofit organization constituted a conflict of interest.

Since then, CAs have become more separate in their operations. Their missions, however, remain the same—to assist parks in the areas of interpretation, research, and visitor services.

Most CAs earn their income primarily from retail sale of books and educational materials. But no two cooperating associations are alike. Some do fundraising, some offer interpretive services, some publish educational materials. Collectively, they contributed approximately $17 million to the NPS in funds and services during fiscal year 1995.

Advantages of Association Publishing

Because CAs are private corporations, they are not subject to the same laws and rules governing federal agencies, most notably (in the context of publishing) purchasing, contracting, and copyright. By working cooperatively with associations to publish interpretive materials, and using private money, NPS may have access to some private sector advantages:

- Broader selection of contractors for goods and services
- Freedom from lowest-bidder regulations

- Freedom from the time-consuming federal contracting process
- Potential for shorter turnaround time
- Potential for dollar savings
- Prompt payment of bills
- Ability to provide copyright protection except for public domain contributions
- Economies of shared labor and time.

In short, working with cooperating associations to develop publications can provide parks with more options, greater ease of development, and can save significant amounts of time.

The net result can be consistent, accurate publications sharing a common graphic identity and fitting into a parkwide publishing plan.

My handout about the Grand Canyon newspaper *The Guide* clearly delineates the role of the newspaper and the association's role in producing it. This policy statement might help those of you who are involved in producing park newspapers. Another handout suggests some other co-publishing partnerships in which associations could become involved for the benefit of the park, the association, and the visitor.

Appendix...

See the appendix for material related to working with cooperating associations.

Publishing With Partners

Steve Kemp

Steve Kemp is Publications Director of the Great Smoky Mountains Natural History Association. He is the author of Trees of the Smokies *and has written articles for several magazines.*

One of the strengths of cooperating associations is their ability to publish quality books and other materials that enhance visitors' enjoyment and understanding of the parks.

NPS(DO)-32 states that publishing is one of the primary purposes of cooperating associations: "Sponsoring or co-sponsoring the development and production of materials which directly or indirectly increase the understanding and appreciation of individual park units, the National Park System, or the National Park Service."

Publishing was in the charter for the first cooperating association created in Yosemite in 1920. It is in the charter of my association, Great Smoky Mountains Natural History Association, and is probably in the charter of the cooperating association that serves your park area.

Park Service employees should consider working with their cooperating association, no matter how small, to accomplish the park's publication/interpretation goals. You may wish to consider outside funding (Friends groups, National Park Foundation, private donations, etc.) to get started.

Start small. Some of the most popular and profitable publications produced by cooperating associations are folders, trail leaflets, road guide booklets, and similar items. Nut-and-bolts interpretive guides to roads and trails are often very successful, as are guides to hiking, auto touring, boating, camping, and other activities. Beware of large, expensive, full-color books if your experience is limited.

When planning publications, look at your park's themes and values. Is each of the themes and values covered by a range of publications in your visitor centers? What themes lend themselves to interpretation through a publication?

Publications Committee

At Great Smoky Mountains National Park, a committee has been established to plan publications for the upcoming two years. Committee members are:

- NPS Chief of Interpretation
- NPS Assistant Chief of Interpretation
- NPS District Interpreters
- NHA Publications Staff
- NHA Executive Director
- NHA Board of Directors' Publications Committee

The full committee meets to compile all suggestions for publications and then prioritizes a feasible number of new publications for the following two years. Cost estimates are compiled by the NHA Publications Director, and the list is submitted to the NHA Board of Directors as part of the annual budget process.

Park Newspapers

Over the last five years, Great Smoky Mountains Natural History Association has done three things that have improved the quality of its park newspaper:

1. Persuaded a professor at the University of Tennessee to conduct a readership survey for our *Smokies Guide* newspaper. The survey was done as part of a sociology class at no cost to the park or the association. The survey was conducted for a full year in concert with the four seasonal issues of the park newspaper. From this survey we have found what percentage of readers are first-time park visitors and what their primary interests are.
2. Hired a professional graphic designer (Lee Riddell of Jackson, Wyoming) to design a format for the newspaper. Cooperating association staff members now use the format as their template for each issue.
3. Created a *Smokies Guide* Editorial Board Committee. Its members are:

    - NPS Chief of Interpretation
    - NPS Assistant Chief of Interpretation
    - NPS District Interpreters
    - NHA Publications Staff
    - NHA Executive Director

    The committee meets four times per year (three months prior to the next issue), and plans what articles will appear on each page. Writing duties and deadlines are assigned at the meeting.

Briefing Statements

Another recent NPS/cooperating association publications project of note has been the development of a series of official resource issue briefing statements. Planned titles include: Black Bears, Fire Management, Air Quality, Old-growth Forests, and Non-native Plants.

The intended audiences for these publications are park neighbors, clubs, teachers, and the news media.

Again, we are having a professional graphic artist create a format for the series. The four- to eight-page 8.5X11 inch booklets will include photos, charts, and graphs. The goal of this series is to spread the word to local and regional audiences about issues of concern to park managers. The publications will be distributed free of charge. Funding for the publications has come from five organizations, including the National Park Service, the Friends group, and the cooperating association. This truly will be a publishing with partners project.

Tips and Tricks From the Field

Tom Haraden

Tom Haraden is South District Naturalist at Grand Teton National Park. He has written and designed numerous site bulletins and other publications at Grand Teton and other parks.

Most of us enjoy the variety in our jobs whether we work for the National Park Service or the cooperating associations, but at times this variety works against us.

We prepare schedules, plan budgets, supervise a staff, give programs, and in general perform the various duties that keep a park or association operating. These duties also include being a writer, editor, designer, and computer expert. Unfortunately, we often don't do these things enough to get good at them.

In this closing session of the workshop, I plan to refresh your memories about many topics that were covered earlier this week and to give you a checklist of things to consider that is based on my experience of working on publications in different parks. You might call this session a reality check.

For example, when you are budgeting park money for printing it is important to realize that the new brochure you are working on may cost as much as two yards of asphalt, four picnic tables, or a half hour of helicopter time. Funds spent for one project usually means there won't be funds for another project. This is a fact of day-to-day park life that most full-time professional designers don't have to worry about.

Use the following tips, suggestions, and questions as ways of streamlining your publications preparations and making good use of your time.

Get Ideas

- Think about your publications needs all the time; look at photos, drawings, and maps wherever you come across them, so you will recognize a solution to one of your problems when you see it.

- Look at designs in magazines, catalogs, books, maps, and museum exhibits, so you can recognize good design when you see it. You don't have to copy what others have done, but what others have done can enhance your own ideas.
- Train yourself to consider many ideas and not get locked into one solution.

Park Publications Plan

In putting together a park publications plan, ***establish the need*** for each proposed publication:

- What is the purpose or why are you writing, editing, and producing this publication?
- Who needs this publication? Is it the visitors (to answer questions, to find their way, to plan their trip) or is it the park staff (to prevent resource damage, to gain compliance)?
- Who is the audience? Will they understand the publication's purpose, will they read it, will they find it useful?
- How will it be distributed to the intended audience? Will it be distributed at the entrance station, visitor center, and/or campground?

Choose the best way to present the information. A publication is not the only way. Don't jump to conclusions. Really think about the most effective means to meet the needs.

- Would a poster on a bulletin board work better than a publication?
- How about a sign along a road, a wayside exhibit at a trailhead, an exhibit in the visitor center, or personal services?
- Would any of them be more effective in getting your message across? If you do choose a publication, consider how to best present the information within it. Will it be primarily through a text, charts, maps, photos, illustrations, and/or diagrams? Apply this kind of thinking and questioning to all of your park's needs to create a comprehensive publications program. Combine and eliminate ideas to reduce cost, save time, meet needs, and deter indiscriminate growth.

Plan and schedule. Thoroughly plan your entire year's program and get the other divisions to buy into the plan.

- Estimate the time it will take to complete all the obvious phases, such as writing, editing, and designing. And allow time for the not-so-obvious phases, such as taking photos, finding illustrations, making maps; getting permission to use photos, illustrations, and maps; checking the regulations and

all the information; getting the text approved by the chief ranger, the superintendent, and others; and correcting all the mistakes.

- Prioritize your needs so you can budget your time and money. You may not be able to do it all, so do—or have someone else do—the most important writing. Before you make a writing assignment, make sure the person knows the subject and can write well. Make sure the deadlines are clear and realistic. Decide who will edit the text; will it be someone on the staff or a freelance editor?
- Review the materials for accuracy and to see what improvements can be made. Specify what you want the reviewers to look for, such as accuracy, spelling, grammar, design, sense, etc. Allow them the freedom to be critical; you or whoever is in charge of the project—someone *must* be in charge—can sort out all the comments later. Give other divisions time to review the materials and have them review before each reprinting of the publication. And take into consideration the constraints that others are working under. Show them what the publication will look like; don't rely on a description. Show them a dummy layout or mockup.
- Budget time for the printing phase. There is no such thing as a rush job. Poor planning on your part does not constitute an emergency on the printer's part. Figure out when you need the publication and how much time the printer needs to complete the job. Be sure to include time for creating negatives if done by a service bureau.
- Consider the entire publications program when you budget your funds. Think ahead on how long you want a supply to last and how often you can afford to reprint a publication. For example, fishing regulations change every year, so you must print them every year. A mammal checklist, however, does not change that often, so you might consider printing a two-year supply every other year and printing a bird checklist during the in-between years. You can save a lot of money by printing more copies the first time rather than paying twice to set up the press. In putting aside funds for printing, don't forget to include funds to cover costs associated with handling artwork and photos, service bureaus, negatives, proofs, and shipping.
- Create a distribution plan. Sometimes people produce a publication and it sits in a warehouse, because no one estab-

lishes an ongoing distribution plan. Will the publication be handed out or sold at entrance stations, at visitor centers, by patrol rangers? How will they get it to distribute it, how many do they need, who will monitor its use, how fast will they go through their supplies? Do the figures indicate a definite need for the publication or is the publication improperly distributed? Write up a distribution plan, update it every year, share it with other divisions, and ask for their comments. Train others so they, too, know the process. Park and association staffs change often, so the distribution plan—in fact the whole publications program—can't be left to one individual.

Keeping Records

Records make it easier for you to remember what you did so you'll know how to duplicate it. They also allow those coming behind you to produce publications to the same high standards. Information in your head is useless to others, so formally write down this information so others can find it and use it. Remember, it's not your publications program, it's the park's.

- List what typefaces and sizes you commonly use and how you use them for headings, for subheads, for main texts, for captions, and for credit lines. Keep records on what inks and what paper sizes, weights, and folds you use. These records not only will help you when you reprint publications but will help you bring a consistency to your whole publications program.
- Prepare a park stylebook to help you be consistent in your publications. A stylebook will make your life easier as both a writer and an editor by answering questions that come up regularly. You won't have to make decisions about language usage each time you develop a publication. Your style might be 1950s instead of 1950's; a.m. instead of AM or A.M.; flash flood instead of flashflood. You shouldn't use snowmobile in one place and snow machine in another. You should use parallels, such as men and women, not men and ladies. You should be consistent in the way you show area codes with telephone numbers—with or without parentheses, hyphens, or spaces. Create a style guide for your maps, too. For a good reference book, look up *The Desktop Style Guide* by James Felici (also see the annotated bibliography in this handbook).
- Number your publications so you can keep track of which one is the current edition and so you can find them in your com-

puter. Here is an example of one way to do this: brochure number-park-month-year becomes 7-CANY-3-92 on the brochure and becomes 7CANY3.92 on the computer file.

- Keep a publications file folder containing a clean hard copy, a computer disk backup labeled with information on who printed the publication, when it was printed, how many copies were printed, the total cost, and cost figures for various aspects, such as negatives.
- Maintain a corrections file for each publication as you and others discover mistakes or come up with new ideas or improvements. Refer to the file when the publication comes up for reprinting.
- Create an image file folder containing hard copies of scanned images by subject and labeled with a disk name or number and a file name. Store your disks in some order and keep track of copyrights, permissions, and use limitation letters.
- Keep track of your printing films. Are they in the park or at the printer? Label them, and get rid of outdated negatives so they are not used by mistake in future reprints.
- Establish handy map files, so you don't have to scrounge around for an appropriate map when you produce a new publication. Keep copies of maps you may need for reference; base maps you have constructed; detailed maps you have made from base maps, and hard copies and disks of scanned maps.
- Write down information on service bureaus' capabilities. How far away are they, what computer applications do they have, what types of disks can they take, what are their scanning capabilities, what kinds of printers do they have, what size output can they produce, can they produce negatives, and what is the name of the person to contact? To get the best quality work, do not rush a service bureau. Find out when they typically have slow periods and try to get your work done then. You also might get a better price then.
- Keep records of your printers' capabilities. Write down their paper selections, folding capabilities, typical start-to-finish time frames, how they like to receive the negatives, how they like the photos prepared, whether they can run their own negatives from disks, how they package and ship publications. Try to develop a good talking relationship with printers. Find

out when their busiest times are. If you can wait, you might get a better price if they can print your publication between other jobs. Expect to pay the fair price and stick with a printer who works well with you.

- Maintain ongoing lists of people who can help you: designers, illustrators, photographers, writers, editors, subject matter specialists, cartographers, and proofreaders.

Practical Tips

- Maintain high standards in your publications. Follow your stylebook, stick to your design grids, be particular about the appearance of the type you use and how it is set, and be thorough.
- Make sure your cover photos are strong and effective. Be aware of how they will appear when folded and when a title appears with them.
- When cropping an existing map, check to make sure you haven't cut labels in two; that you haven't left strange loops of boundaries, rivers, and roads; that you haven't left anything that creates confusion and detracts from the purpose of the map. When splicing two maps together, make sure they are the same scale and check for duplications in names.
- The NPS Site Bulletin design system already has a nationwide identity. It is based on a handy grid that can be used manually or on a computer. Many decisions such as proximity, alignment, repetition, contrast, and type have already been made, so it gives you a good start toward improving the appearance of your local publications. If you choose to use this design system, use it right; don't use something similar. If you don't know how to use it, but want to use it, ask the folks in the Division of Publications at Harpers Ferry Center for advice.
- Most of us don't have a choice in what kind of computer and software we can use. Don't bellyache because you don't have the latest this or that. Use what you have. Make the best of it. If you have a choice in computers and software, choose the publications design industry standard in your area of the country. Choose the programs that you can get, will learn, and will use, and make sure they are compatible with the capabilities of your service bureau and printer.

Appendix

Annotated Bibliography

Workshop Handouts

Annotated Bibliography

Design and Typography

Bacon, Edmund N. *The Design of Cities*. Penguin Books.

The elegant design of this book and the beautiful graphic elements that carry through the development of cities such as Rome and Paris has always opened my mind when I needed perspective. *CW*

Bevlin, Marjorie Elliott. *Design Through Discovery*. Holt Reinhart Winston.

This is a wonderful book about design as process and how to draw inspiration from the world around us. *CW*

Bringhurst, Robert. *Elements of Typographic Style*. Hartley and Marks. Point Roberts, Washington. 1992.

Beautifully written (Bringhurst is a poet as well as a typographer), beautifully designed, thought-provoking and full of easily-located useful information. Of typography, Bringhurst says “The satisfactions of the craft come from elucidating and perhaps ennobling the text...” and “Humble texts, such as classified ads or the telephone directory, may profit as much as anything from a good typographical bath and change of clothes...and many a book may look well with some paint on its face, or indeed with a bone in its nose.” *TD*

Burke, Clifford. *Type from the Desktop: Designing with Type and Your Computer*. Ventana Press. Chapel Hill. 1990.

A well-illustrated introduction to typographic considerations. Chapters include Setting Up Your Text, Choosing a Typeface, Adding Display Type, Building Your Type Library, and Creating Your Design and Layout. *TD*

Chappell, Warren. *A Short History of the Printed Word*. Dorset Press.

Gutenberg to now; a concise description of the evolution of printing and typography. *CW*

Collier, David and Cotton, Bob. *Basic Desktop Design and Layout*. North Light. 1989.

This book covers the elements of desktop design using clear examples. It deals with subjects such as legibility, how to emphasize words, organizing a page, using captions and dozens of others. *TH*

Craig, James. *Designing With Type*. Watson-Guptill, 1971.

An introduction and guide to typography, a classic. *JC*

Felici, James. *The Desktop Style Guide.* Bantam. 1991.

A style guide designed for setting your own type on computer. Sections on typographic basics and style help the user understand why things are done in a certain way so informed decisions can be made. It deals with the practical aspects of subjects like leading, point size and line length, hyphenation, justification and something we should all understand called type color: the balance of the words and spaces that leads us to readability. This is a very practical and useful book. It should be on your desk right next to your computer. TH

Parker, Roger. *Looking Good In Print*. Ventana Press. Chapel Hill. 1990.

Excellent guide to design principles. *JC*

Shushan, Ronnie and Wright, Don. *Desktop Publishing by Design*. Microsoft Press. 1989.

This is a basic handbook that integrates the elements of design with using PageMaker. It has an interesting chapter called The Circular Nature of Planning and Doing. The book ends with projects that will give you practice in using the computer and thinking about design. *TH*

Stone, Sumner. *On Stone: The Art and Use of Typography on the Personal Computer.* Bedford Arts. San Francisco. 1991.

This thorough study of the Stone family of typefaces is also a treatise on the traditions of typography, a series of case studies, and an extended and very useful specimen sheet of the many looks of this versatile face. *TD*

Strickland, Carol. *The Annotated Mona Lisa. A Crash Course in Art History from Prehistoric to Post-Modern*. Andrews and McMeel.
A dizzying run-through of art history, very anecdotal and enjoyable. A good perspective of art movements and their social ramifications. *CW*

Swann, Alan. *How to Understand and Use Grids*. North Light. 1989.
This book is exactly what the title suggests. It explains the advantages of using a grid, how to take advantage of their flexibility and how to use them effectively. Nice graphics show several case studies. *TH*

Swann, Alan. *How to Understand and Use Layout and Design*. North Light. 1987.
Three stages of design are shown: Options, Decisions, and Applications. This book shows in a very clear step-by-step manner, with great illustrations, how design works. Checklists at the end of each section highlight points to remember. *TH*

Tschichold Jan. *The Form of the Book: Essays on the Morality of Good Design*. Hartley and Marks. Point Roberts, Washington. 1991.
A compelling collection of essays on traditional book design by a self-described "loyal and faithful servant of the written word." Essays include The Importance of Tradition in Typography, Why the Beginnings of Paragraphs Must be Indented, Planning the Typographical Layout of Books with Illustrations, and Printing Paper: White or Tinted? *TD*

Williams, Robin. *The Non-Designer's Design Book: Design and Typographic Principles for the Visual Novice*. Peachpit Press. Berkeley, CA. 1994.
A well-organized and easy to understand introduction to design and typography. Williams reduces design to four principles: Consistency, Repetition, Alignment, and Proximity. The principles are well illustrated. Like any good introduction, the book increases the reader's sensitivity and whets the reader's appetite for further exploration. Like all of Williams' books, this one is done with high good humor which makes the reading and learning great fun. *TD*

Printing and Production

Beach, Mark. ***Getting it Printed. How to Work with Printers and Graphic Arts Services to Assure Quality, Stay on Schedule, and Control Costs*****. Northlight. Cincinnati. 1992.**
From planning through printing, a great "how to" book. *RP*

Beach, Mark. ***Graphically Speaking. An Illustrated Guide to the Working Language of Design and Printing*****. Elk Ridge Publications. Manzanita, Oregon. 1992.**
A very comprehensive dictionary of graphic arts terms. *RP*

Gosney, Michael; Odam, John; Schmal, Jim. ***The Gray Book*****. Ventana Press, Chapel Hill, 1990.**
A guide to printing with only black and white. *JC*

Lem, Dean. ***Graphics Master*****. Dean Lem Associates, Inc., Los Angeles, 1994.**
An excellent technical reference for production; not intended for the beginner. *JC*

McKenzie, Bruce. ***The Hammermill Guide to Desktop Publishing in Business*****. Hammermill Papers. Memphis.**
A complete guide to the process of printing and publishing. *JC*

Cartography

Dent, Borden. ***Thematic Mapping*** **4th Edition.** *MK*

Robinson, Arthur, et al. ***Elements of Cartography,*** **6th Edition.** *MK*

Style Manuals and Writing

The Chicago Manual of Style: Fourteenth Edition**. University of Chicago Press. 1993.**
This manual is the bible for professional writers and editors. If you do not like what the GPO manual says about something, look it up here—and vice versa. Cite your authority and be consistent. *BH*

Copperud, Roy H. *American Usage and Style: The Consensus*. Van Nostrand Reinhold Co. 1980.

Copperud approaches grammar with common sense and tells us what Theodore Bernstein, Bergen and Cornelia Evans, Rudolf Flesch, Wilson Follett, H.W. Fowler, and other experts think. *BH*

French, Christopher W., ed. *The Associated Press Stylebook and Libel Manual*. Addison-Wesley. Reading, Massachusetts. 1987.

A copy of this book should be a part of every park publisher's library. Almost all of those nagging little questions are answered here: Is national park capitalized when used by itself? Medal of Honor (there is no Congressional Medal of Honor), a.m., not AM, an entire section on punctuation, the difference between fewer and less, etc. *TD*

Strunk, William and E.B. White. *The Elements of Style*. MacMillan Publishing Co. 1979.

This thin volume packs in a lot of writing tips and advice. *BH*

***Style Manual*. U.S. Government Printing Office, 1984.**

Don't laugh, this book is full of good advice if you are willing to wade through lots of material that might not pertain to your writing projects for the government. *BH*

Zinsser, William. *On Writing Well: An Informal Guide to Writing Nonfiction*. HarperCollins Publishers, 1993.

Zinsser gives good, solid, clear advice about writing nonfiction. If you are going to read only one book about writing, read this one. BH

Software

Bozek, Sandy and Rich, Jim. *Photoshop in Black and White*. Peachpit Press. Berkeley. 1995.

This is an illustrated guide to preparing black and white images for reproduction using Adobe Photoshop. It's short, sweet, to the point, and makes this computer application much easier to use to consistently get good results. *TH*

Williams, Robin. *PageMaker 4: An Easy Desk Reference*. Peachpit Press. Berkeley. 1992.

Don't let the number of pages (754) fool you, this is one of the best-organized books I have ever used. Each entry is in three columns: If you want to do this, then follow these steps, and shortcuts/notes/hints. This book is not a cover-to-cover read, rather it is just as the title says: an easy desk reference, one that will quickly answer all of your PageMaker questions and some you hadn't even asked. Note: A PageMaker 5 edition is available, but it is written for the Mac version of the software. The PC and Mac versions are so close in their operation that the PageMaker 5 edition should work well for either. Unfortuntely, there is no equivalent volume for the later versions of PageMaker.*TD*

Will-Harris, Daniel. *Desktop Publishing in Style* (for WordPerfect). Peachpit Press. Berkeley. 1990.

A great guide to using WordPerfect for desktop publishing; also available for Windows versions, too. JC

Magazines

***Communications Arts.* Coyne and Blanchard, Inc. Published eight times a year. Individual issue prices vary.**

Not inexpensive, but a gold-mine of inspiration. The annual design issue is the issue to buy if you buy only one per year. TD

***Print.* RC Publications, Inc. Published bimonthly. Individual issue prices vary.**

Another excellent, if pricy publication. More oriented to case studies than Communications Arts, and therefore a more practical purchase. TD

***Publish.* International Data Group. Published monthly. Annual subscription: $39.00.**

Many reviews on new hardware and software related to the publishing industry. Each issue also offers design makeovers that can be very enlightening. TD

Other Useful Resources

Blue, Martha. By the Book: Legal ABCs for the Printed Word. Northland. 1989

Currently out of print, but well worth searching for.

Tilden, Freeman. *Interpreting Our Heritage*. University of North Carolina Press, 1977.

Nobody has done a better job than Tilden at saying what interpretation is all about and what an interpreter does. BH

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